

OS/2

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The future of compound documents

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November 1994



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Call it the Internet, the Information Superhighway, or even the Infobahn. Whatever you call it, it's here today and available for you to explore and learn from. Here's a road map of OS/2-related places to visit on the Internet, a glossary of confusing Internet terms, and suggested ways for you to find the Internet on-ramp. Don't put off learning about ftps, World Wide Web, archie, and veronica a minute longer!
By Steven J. Vaughan-Nichols.

38 Opening up OpenDoc

OpenDoc is a new infrastructure for managing objects and compound documents that's currently being alpha-tested by OS/2 developers. If you're familiar with Microsoft's popular OLE 2 standard, think of OpenDoc as a superset, with full OLE 2 compatibility, along with unique capabilities of its own. Here's a look inside the evolving OpenDoc standard, and some speculation about the power and flexibility it will offer OS/2 users and integrators. *By Robert Orfali and Dan Harkey.*

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The Workplace Shell stores all of your customization in three locations: the *os2.ini* and *os2sys.ini* files, and in the *\desktop* directory tree. Unfortunately, these files can easily become corrupted — meaning hours of work to restore your system to where you left it. Here are some tips for manually preserving these important files and a review of three tools to automate this process: DeskMan/2, IniMaint, and WPTools.

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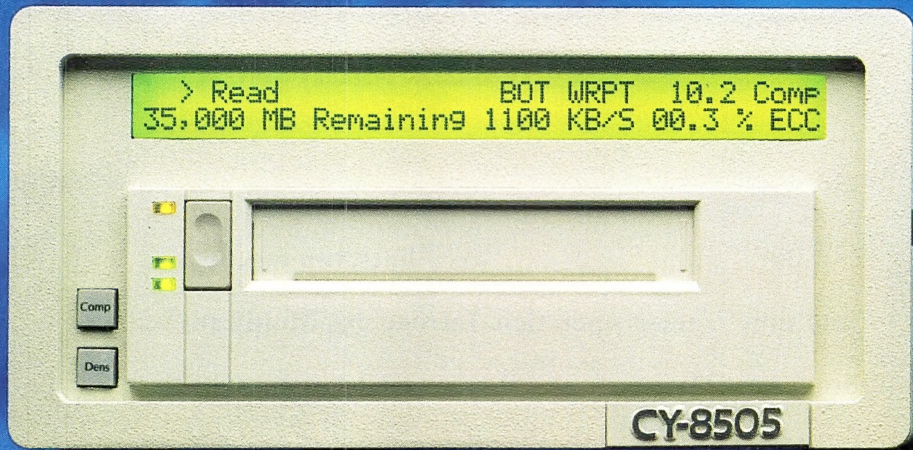
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Perspectives

OS/2 !! SYS01475 OS/2 !! SYS02027

Have you ever wondered why your floppy drives grind when you boot your PC? Part of the reason is that your PC's BIOS (or "basic input-output system," a set of chips that make your PC act like a PC) first does a power-on self-test (POST). It then tries to boot from your first floppy (drive a:), and then from your first hard disk (drive c:). So, the "grind" sequence is a:, b: (for the POST), and then a: (for the boot attempt).

What happens if you have a floppy in drive a:? One of three things, depending on the program your PC's BIOS finds at the beginning of the disk. This special program is called the "loader routine."

If your floppy is bootable (a "system disk"), the loader routine bootstraps the floppy's real operating system, like DOS or OS/2. If the floppy is unformatted (and thus completely unreadable), the BIOS displays an error message.

What if your floppy is a "data disk," in other words, it has been formatted for a PC, but isn't bootable? The disk still contains a loader routine, which was put there by the formatting program (usually *format.exe*). In most cases, that "dummy" loader routine displays an error message. I've tested floppies formatted with a variety of PC operating systems' *format.exe* programs. Under PC DOS 6.3, PC DOS 4.00, and even MS-DOS 3.30, the message is the same:

**Non-System disk or disk error
Replace and press any key when ready**

(I have seen some other versions of DOS that display other messages, but I can't currently lay my hands on them.)

There's a problem with this system, unfortunately. That loader routine takes over your CPU and has complete control over your PC's hardware. That's why one of the favorite tricks of virus writers is to replace benign floppy loader routines with nasty "stealth" viruses.

But let's talk about everyone's favorite operating system. OS/2 comes with a disk-formatting package (which can be run either under OS/2 or DOS). When *format.exe* prepares a data floppy, do you know what it installs as a loader routine? A simple program that locks up the PC after printing those infamous lines

Every time I see those double-exclamation marks, my heart stops—has my hard disk fried? Oh, I remember. It's just that @#!@# floppy-disk-in-drive-a: message again.

Why these cryptic messages? According to IBM's OS/2 development team, it's because they didn't want to worry about native languages—for example, someone in France accidentally trying to boot from a floppy disk formatted in Germany, and thus seeing a German-language error message. Thus, the "universal" numeric error code. Sorry, guys—that's a pretty thin excuse.

Why doesn't OS/2 let you "press any key" to retry the boot? I had thought that it was an attempt to control stealth-virus infections. But I'm assured by the OS/2 designers that a "press any key" loader can handle virus protection. Go figure.

By the way, **SYS01475** means that the startup file *os2boot* can't be found and **SYS02027** means that the system must be restarted. You can find details in the *OS/2 2.1 Installation Guide*, pp. 124-125. The *Guide* gives poor advice, though, saying you should "install a system diskette and restart the system." In most cases, you should *remove* the non-system floppy and restart the system.

When you're booting from a hard disk and something goes wrong with your system files, those messages might be meaningful. But when OS/2 prepares a data floppy, the problem won't be that *os2boot* couldn't be found, but rather that the floppy should be removed from drive a:.

Here's my advice to the OS/2 development team: Sure, keep those cryptic numeric codes—but supplement them with text appropriate to the version of *format.exe* used. For English, my recommendation is:

**Remove non-bootable floppy from drive A:
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Alan Zeichick
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OS/2 !! SYS01475
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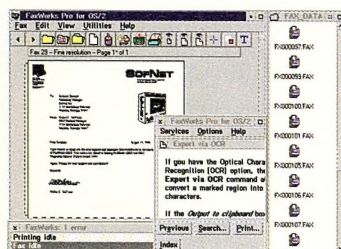
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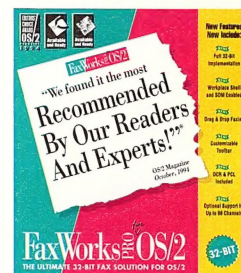


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Letters

REXX II: the SQL

Dear Editor:

I agreed with Brian Proffit in his review of the REXX GUI products (September 1994, pp. 42-49), except for one thing. He stated that the difference between the VisPro/REXX Bronze and Gold versions was that the Gold version was intended for use in more intense development. It seems to me that the key distinguishing characteristic is support for SQL.

Guy Sharf
via CompuServe

I think developing for SQL is more intense! Other features are found in the Gold version but not the Bronze, including sliders, notebooks, containers, business graphics, drag and drop in your programs, and MMPM/2 video.

-Brian Proffit

16MB preferred, but not required

Dear Editor:

Brian Proffit's review of WordPerfect for Windows 6.0a with OS/2 Integration Tools (September 1994, pp. 20-23) missed a significant point—memory requirements. WordPerfect lists systems requirements for this package as 12MB RAM at minimum with 16MB recommended.

I run WordPerfect for OS/2 5.2 on my 8MB machine. If I have to buy 16MB of memory, this software upgrade will be a very expensive one.

Arthur G. Black
Sunnyvale, Calif.

Unlike most vendors who quote the smallest possible memory requirements and act surprised when the user complains about performance ("Well,

we said it was the minimum, but we recommend xMB more"), WordPerfect Corp. erred on the conservative side.

WordPerfect does run well on a 16MB system—I had no problems running it on an 8MB 386-25. In fact, using the OS/2 Performance Beta, I successfully ran WordPerfect 6.0a on a 4MB 486-25. Not, perhaps, the ideal configuration, but an acceptable one.

In other words, the upgrade isn't as expensive as it might sound. I encourage you to try the upgrade on your 8MB system. You might be pleasantly surprised.

-Brian Proffit

The 15-minute CD-ROM

Dear Editor:

I agree with the editorial on the 15-minute CD-ROM (September 1994, p. 7). What do you do when you find yourself stuck with megabytes of .dll and .drv files—not to mention changes to your .ini files and to config.sys?

The free demonstration disk is even worse than the 15-minute CD-ROM. After following the detailed instructions for running the SETUP or INSTALL program and pressing <Enter>, I hope and pray that the installation will leave my key system files and hardware alone. After having been stuck with unknown files and demonstrations that I can't delete, I've learned the hard way. When the advertisement says "free demo disk available," say "no thanks" and turn the page.

Of course, the world has more pressing concerns and I don't propose an international conference on software uninstalling, but I just wanted to say that I thought your editorial was appropriate.

Nico Lomuto
via CompuServe

Dear Editor:

"The 15-Minute CD-ROM" (September 1994, p. 7) should be required reading for all application developers! Unfortunately, your observations about "the mess" that many applications leave on our boot drives reflect the norm, instead of the exception.

I would like to point you and your readers to a tool that can help identify and clean up at least part of the clutter. You mentioned that, "Finding the .dll and .drv files hiding in the \windows tree was difficult." Well, it no longer has to be.

Recently, Larry Waibel added a snapshot function to his shareware directory matching utility, PMD-Match (pmdmat.zip in Library 1 of the CompuServe OS2BVEN forum). With this addition, we can now:

- Record a picture of a single directory, or an entire drive, as it existed just before we installed a new application.
- Record a second picture of the same directory or drive, immediately after the installation.
- Compare the above two snapshots, identifying all new and/or changed files and directories.
- Record a snapshot of only the additions and changes for use if we decide to remove an application from our hard disk.

I always use PMDMatch to snapshot my OS/2 boot drive (and sometimes my \windows directories if they are on another drive) before and after I install an application.

Bill Speights
via CompuServe



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IBM

IBM Warps Through The Beta Cycle

THE SECOND BETA-TEST OF THE NEW OS/2 PLAYS TO MIXED REVIEWS.

BY ALEXANDER ANTONIADES



The developers in IBM's Personal Software Products Division surely consider the first public beta-test of its next release of OS/2 (which IBM likes to call by its code-name, "Warp") a smashing success. The first Warp beta received many accolades in the media, and even won a best-of-show award at Atlanta, Georgia's Spring COMDEX. IBM estimated that as many as 15,000 people either purchased or downloaded the beta and, given the overall stability and performance increases, it has generated a good deal of word-of-mouth enthusiasm.

It was into this atmosphere that IBM dropped another Warp public beta in mid-August (allegedly only four days later than originally scheduled). Warp II includes major enhancements to both the operating system and the associated utilities. One of the main features of the Warp II beta was what IBM calls a "one-click" installation routine (although it actually ended up requiring two mouse clicks). This much-ballyhooed installation program actually searches the hardware on the machine being installed, then installs what it hopes are the right drivers. The new release also integrates MMPM/2 and display drivers into the main installation program.

From most early reports, the new installation procedure is the most problematic area of Warp II. But once users had the beta installed, most comments were favorable.

Other Warp II improvements in the base operating system include

new 32-bit Workplace Shell display routines, better archiving and recovery systems, and a new boot-up option, which allows the user to choose from a variety of options, including restoring from any of the last three configurations and booting straight to a command prompt. A new 32-bit printing subsystem allows for IRQ polling. Warp II also supports 32-bit Win32s applications and the "Warp for Windows" version will support Windows 3.11 and Windows for Workgroups. The Workplace Shell has been upgraded to SOM 2.0 compliance which, once SOM 2.0 applications are available, will help reduce the chances of .ini corruption, because programs won't share the same .ini address space.

The Workplace Shell itself has undergone many usability tweaks, many cosmetic, some substantial. Display-adaptor support has been expanded to give more adapters the ability to change resolution through the Settings notebooks. Other changes include better sorting of information within folders, a faster "find" utility, completely redrawn icons, and improved object menus (including one favorite request: placing "Settings" as a main-menu option. IBM has also integrated the "front panel," a launch-bar utility, into the Workplace Shell to give users easy access to various programs

Applets galore

Remember the applets included with OS/2 2.1? Well, they're gone, except for the system editor, enhanced edi-

tor, seek-and-scan tool, the icon editor, pulse, picture viewer and clipboard viewer. In their place will be what IBM calls the BonusPak, which will be separate from the main part of the OS/2. (If you really need those original applets, IBM has stated that they will be made available on BBSs.)

According to IBM officials, the next OS/2 will be offered in different "packaging" options, reflecting different versions of the BonusPak. For example, a network/client OS/2 package might include utilities like TCP/IP in its BonusPak; this version would, therefore, be more expensive than base-level OS/2.

The BonusPak included in Warp II reflects the base level of the next OS/2 version. The core of the new applets is a new version of IBM Works (currently marketed as Footprint Works in the United States and Canada). This mini-suite package will be an upgrade of the current Footprint Works offering, and will include word processing, spreadsheet, database, charting, graphics, and report writing tools. The full version of another formerly independent product, Arcadia Workplace Companion, will also be integrated into IBM Works. The upgrade policy for current Footprint Works and Arcadia users who don't buy the new version of OS/2 has not been announced.

Light-weight versions of two other commercial products will be included with the first BonusPak. A modified version of Sofnet's Fax-Works 2.0 will allow faxes of unlim-

ited sizes to be sent, but has limited fax and contact-management capability. The other is a new Workplace Shell version of Hilgraeve's Hyper-Access Lite telecommunication program, which includes Zmodem transfer capability. Also included will be the first release of CompuServe Information Manager (CIM) for OS/2. This set of applets will most likely be linked to special

offers on full versions or services in question.

Other items include two IBM-designed products. IBM's Person-to-Person groupware product features a whiteboard that eight people can share over a network or via modem. And the new System Information Tool gives the user a rundown of what hardware and software is installed on their machine.

Connecting to the market

Looking for a hook on which to demonstrate their new operating system, IBM has hit upon one of today's hottest computing trends: the Internet. As part of the base-level BonusPak, rumors are that Warp (but not the Warp II beta) will include fully functional Internet connectivity software, including gopher, ftp, and other network-surfing tools (including a rumored World Wide Web browser). These tools will be compatible with third-party Internet service providers like Delphi, or a new consumer Internet host that IBM will set up through its Advantis subsidiary. Advantis, hardly a household name, is a major IBM-owned network-communications provider that serves as the backbone of the Prodigy on-line service. Interestingly, no Prodigy viewer is included in OS/2, despite the fact that IBM is a part-owner of that service.

By including Internet connectivity, near-painless installation, and set of truly useful basic applets, IBM is betting that the next version of OS/2 will be able to overcome consumers' traditional reluctance to venture outside of the DOS/Windows domain. IBM plans to exploit the delays in Microsoft's Chicago (Windows 4.0), which could ship as late as March 1995. The Personal Software Products division has already committed millions of dollars in ads to support this product beginning in October, so if Warp's ship date slips, it won't slip by much. OS/2's biggest obstacle at this point is the hoard of bugs that are accumulating from all of the new features and applets that are being tested by the public for the first time. And, while IBM is saying that they are on their original schedule to ship on time, it looks like small bugs will undoubtedly dog this release. Hopefully, IBM can clean up most of the major bugs, so that OS/2 will be ready for prime time when the TV commercials start airing.

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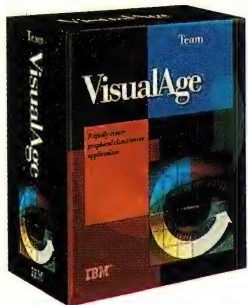
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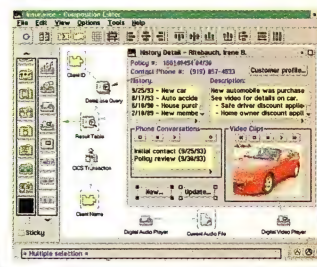
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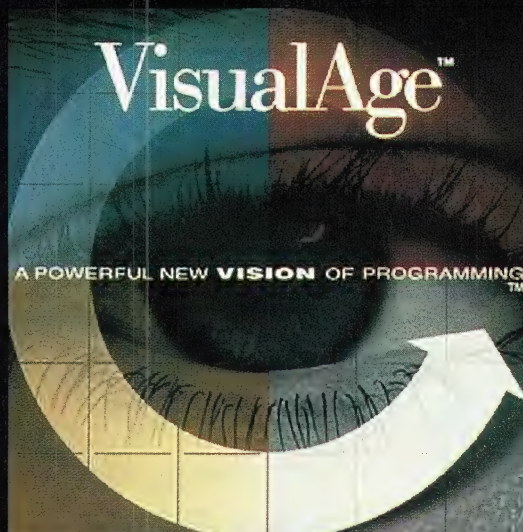
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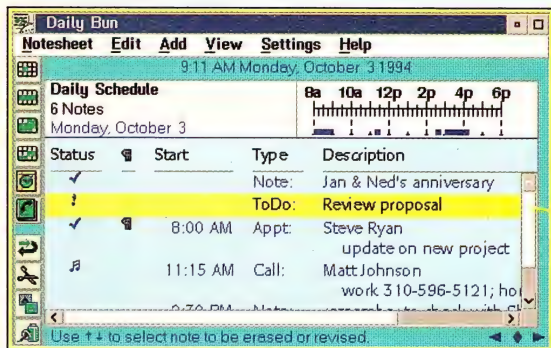
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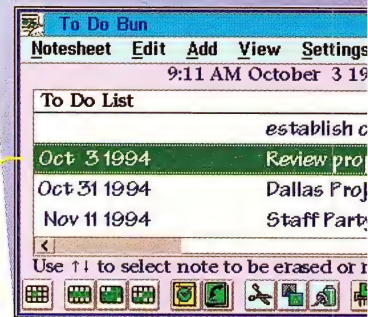
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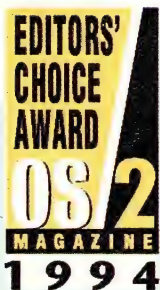
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Changing Relationships

IF COMPUTERS AND HUMANS CAN LEARN TO UNDERSTAND EACH OTHER,
EVERYBODY WILL WIN BY AMY D. WOHL



The entire history of computing can be viewed as a series of relationships between centralized and distributed computing—or, to put it more visually, as a battle between the Desktop Davids and the Glass House Goliaths, where youth and agility are sure to win. But, in the messy and chaotic arena of the battlefield, allies and strategies can change abruptly. Reasons that seemed compelling enough to propel you into a war may seem almost ridiculous when you're in the middle of what looks like a losing battle.

We've been moving in the direction of distributed computing since the 1970s when just a few office workers (relatively speaking) had access through time-shared terminals to mainframes or minicomputers. Now, we live in a different world in which millions of users sit at interconnected personal computers.

It seems that the Desktop Davids have been doing most of the winning. They've bowled us over with issues like graphical user interfaces, user control of the personal and workgroup computing environment, the politics of data ownership, and compelling cost arguments. After all, it's hard to convince anyone that a mainframe and its terminals cost less than a PC—or even less than hundreds of PCs.

Personal computers have been amazingly cooperative in the battle to continue the progress of

computer distribution. Each year they become more powerful (and therefore able to perform more interesting work with less human effort) at lower prices. As a result, developers can build better interfaces, automate more complex applications, and take larger and more complex tasks down from larger environments into the world of microcomputers.

But computers, being technology, are not very good at changing the forces of human nature. Offices (and factories and laboratories and shopping malls) are filled with human beings who must successfully use the computers we continue to buy, install, program, and upgrade. Human beings consistently obey their own sets of wants and needs.

Accessing information—without limits

Not much is predictable about where information of value might be located, what format it might be in, or when a user might need it. But quick access and acquisition is almost always an urgent need once the information is identified and located. It goes well beyond Bill Gates' cry for information at your fingertips, because users want more assistance in every part of the process—from identification, to access, to acquisition (preferably seamless and without knowledge of the information-hosting system), and further manipulation.

A need for integration

Most humans prefer to interact with the world in an organized way. Organization enables us to be more efficient and to handle larger numbers of human contacts and larger amounts of information. We want our information world to appear to be completely seamless and integrated—however widely it is distributed. The OS/2 environment is particularly forgiving in this regard, by permitting the user to include DOS, Windows, and OS/2 information in multiple simultaneous windows on a single screen. Remote sessions on other systems can also be seen as *windows* into these remote computing environments.

But today, each of these environments looks different. Every program carries its own interface style (except for a few programs designed to be used together, such as the Lotus SmartSuite for OS/2). We need to move beyond today's level of integration to the next generation of software, which will provide interfaces as separate objects that can be applied to programs. Such a development would allow the user to filter incoming programs through a familiar interface environment. Language differences could also be handled in this filtering process.

A need to support more complexity

Humans are never satisfied. Give us an inch and we'll ask for a mile. We constantly challenge the comput-

ing environments because we are constantly trying to perform new tasks beyond the conception of the system's design or capacity. Systems slow down, struggle, or even fail. Users are dissatisfied and frustrated. We break through to new levels of performance and functionality only to start the process again. We need systems that are far more gracefully scalable than the personal computers of today—systems that are as capable of expansion and growth into larger and more complex systems as the humans who direct and use them.

All such developments require human support. We can build all kinds of support into the computing environment—from reliability, to communications that enable remote assistance and artificial intelligence to assist users in learning tasks or making choices. But, we can only offer help with the tasks we can predict will occur. Beyond a predictable

level of randomness, our ability to build computer-based support fails us and we need human help. We must optimize systems for the efficient use of human time when help is needed. Imagine help workflows, automatic help triage systems that offer assistance within the immediate environment and then automatically take the user to other environments—including remotely located human help, when required.

Still, the distribution of systems has a limit. Consistency or standards are sometimes required to give users the access or integration they seek. Consistency can no longer occur as an imposition from above. It will occur because the users request assistance or because of an interrupting event. Interrupting events occur when management requires a system or function that is critical to the business. Or, they can occur when there is general agreement in the organization that a goal must be

met. An interruption to computing autonomy will be permitted, compromises will be made, and the business will move smoothly on.

After the interruption, the information system will be a little more centralized, a little more integrated, or a little more standardized, but it will work more smoothly for the organization. Compromises to computing autonomy are acceptable to achieve access to limitless completely organized, and infinitely accessible information. Total distribution of function and control with no vision or agreement equals chaos—and we have too much at stake to wish for that.

Amy D. Wohl is president of Wohl Associates, a consulting firm specializing in office information systems, personal computing, and end-user computing. She is also editor of the Trendsletter, a monthly newsletter on computer industry trends.

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The Impact of the Microsoft Consent Decree

THE FALLOUT FROM THE DEPARTMENT OF JUSTICE'S RULING FINDS REDMOND'S FAVORITE SON IN A HOMERIC DILEMMA BY WILLIAM F. ZACHMANN



The consensus view of the proposed consent decree (agreed to by Microsoft under threat of an anti-trust lawsuit by the U.S. Department of Justice) is that Microsoft got off with an insignificant "slap on the wrist." Most writers in the press and analysts have said that the ruling will have no material impact on Microsoft's business, market share or financial status. Microsoft has maintained this view on the matter.

The consensus, as is so often the case, is wrong. Assuming that the final judgment will be identical to the consent decree (which is likely, but not certain), Microsoft will lose what have been some of its most powerful weapons. The result will not only be substantial setbacks in market share and profitability for Microsoft, but major gains for OS/2. To understand why, we need to consider the background events leading up to the consent decree and the details of its contents.

A crucial factor to the success of Windows 3.0 and 3.1 has been Microsoft's preloading deals with personal computer system vendors. Goldman, Sachs & Co. (Microsoft's lead investment banker) estimates that only three million new copies of Windows were sold through retail channels during 1993 compared to 12 million copies preloaded by system vendors or original equipment

manufacturers (OEMs). They estimate that, in 1994, the number of new copies of Windows preloaded on systems by OEMs will grow to 19 million copies while retail sales remain at only three million copies. Goldman Sachs estimates that, by the end of 1994, the cumulative number of copies of Windows shipped will reach 50.1 million. Not even 10 million of those, however, will have been sold directly.

Clearly, preloads are the primary means by which Windows has sold and by which Windows has achieved its desktop market share. By the end of 1994, more copies of OS/2 will have been sold directly through retail venues, in just over two and a half years, than copies of Windows 3.0 or 3.1 have been after nearly four years on the market. Through OEM preloads, Windows has, so far, been winning the numbers game with OS/2. Fewer than 10 percent of the copies of OS/2 shipped have been preloaded, while more than 80 percent of the copies of Windows sold were preloaded by OEM system vendors.

Microsoft used what has been called a "per CPU" or "per processor" licensing deal with system vendors. Microsoft licensed system vendors to bundle Windows (and DOS) with their systems if they signed contracts agreeing to pay a set amount for each system

sold that contained a particular type of processor (for example, a 486 DX66). Vendors paid the per-CPU charge whether or not Windows and DOS were actually preloaded on the system. So, if a customer ordered a system with, say, UNIX or NextStep, the system vendor still had to pay Microsoft a royalty for DOS and Windows, even though no copy of DOS or Windows had been loaded on that system.

OEM vendors got nothing from Microsoft except the right to make a copy of MS-DOS and Windows and put it on the system they sold. If they wanted to provide their customers with documentation, they had to pay Microsoft a substantial additional sum or print it themselves at their own expense. Royalty payments from OEMs were, in effect, pure profit for Microsoft—they amounted to nearly half of Microsoft's total profit in fiscal 1994 (which ended June 30, 1994).

Theoretically, system vendors did not have to enter into per-processor royalty agreements with Microsoft, but could have, instead, simply purchased enough individual copies of DOS and Windows. In practice, however, it was not economical to do so, because Microsoft demanded much higher prices for individual copies (even in quantity) than it did for royalties on a per-processor basis. To buy copies as OEMs actu-

Well over

**50 SYSTEM VENDORS HAVE
ANNOUNCED THAT THEY
WILL OFFER OS/2 PRELOADS AND MORE ARE
SIGNING UP EVERY MONTH.**

ally needed them was generally not an option. Prohibitive charges for doing so would not have allowed them to be competitive with other companies who paid Microsoft the much lower per-processor royalties. Microsoft also demanded that system vendors enter into long, multi-year contracts in order to obtain the lower, per-processor royalties. This tactic effectively locked a substantial portion of the market into long-term, per-processor royalty contracts with Microsoft.

The complaint filed by the U.S. Department of Justice against Microsoft states that "according to Microsoft, in fiscal year 1993, per-processor agreements accounted for an estimated 60 percent of MS-DOS sales and 43 percent of Windows sales to OEMs." Those numbers were surely considerably higher in fiscal year 1994. OS/2 (and any other competitive operating system) was effectively locked out of consideration as a result of these contracts. Since vendors had to pay Microsoft for DOS and Windows anyway, it was both simpler and more profitable to provide them with every system, by default. Other operating systems were offered, if at all, only at substantial incremental cost and only in response to specific customer demands.

Sales of OS/2 were also harmed by the extremely unwise policy, on the part of the IBM PC Company (which has since been reversed), that strived to imitate the clone vendors in making MS-DOS and Windows the default offerings on the majority of systems. However, in addition to this unsuccessful policy, OS/2 faced a severe uphill battle for OEM preloads against Microsoft's entrenched, long-term, growing number of per-processor royalty agreements. The same conditions that had earlier doomed Digital Research's efforts to sell DR-DOS preloads to OEMs were frus-

trating IBM's efforts to get OEMs to preload OS/2, as well.

The proposed consent decree, however, changes all that—dramatically, and for good reason. Microsoft's per-processor royalty contracts for DOS and Windows were a flagrant violation of the Sherman anti-trust act. The consent decree completely decimates the entire structure by which Microsoft was able to force a growing number of system vendors into what the Department of Justice characterized as "exclusionary and unreasonably restrictive licensing agreements to deny others an opportunity to develop and market competing products."

The consent decree prohibits Microsoft from entering into contracts of longer than one year (although it allows for a maximum of a one year renewal, solely at the discretion of the OEM). It prohibits Microsoft from imposing any penalty or charge on OEMs who choose not to renew. It absolutely forbids any contract that "by its terms prohibits or restricts the OEM's licensing, sale or distribution of any non-Microsoft Operating System Software product." Most important, however, it totally prohibits Microsoft from entering into any further per-processor contracts and requires that existing per-processor contracts be converted to per-copy contracts. OEMs will only need to pay Microsoft if they actually ship a copy of DOS or Windows. Microsoft must notify all system vendors that they are now operating under per-copy instead of per-system contracts

and therefore need not pay a royalty to Microsoft unless they actually ship a system with DOS or Windows. The consent decree also forbids Microsoft from tying the sales of one product (Windows, for example) with another (MS-DOS).

It will be much easier now for IBM to convince compatible system vendors to offer OS/2 as a preload option. OEMs no longer need to pay twice for operating systems, so they won't have to charge their customers twice for an operating system that isn't MS-DOS or Windows. Well over 50 system vendors have announced that they will offer OS/2 preloads and more are signing up every month.

A second, but less obvious development that has resulted from the consent decree gives system vendors a number of good reasons to pay Microsoft less than they did previously—even if they do not sell a system with an alternative to DOS and Windows. Many customers, for example, already own a valid DOS or Windows license that they can use on a newly purchased system and, therefore, do not need to have a copy preloaded for them. Under the per-processor licenses, now forbidden to Microsoft, the OEM vendor had to pay Microsoft a royalty anyway, so they had no reason to reduce the cost of a system sold without DOS or Windows. Now, however, if a vendor ships, for example, 40 percent of their systems with MS-DOS only (but without Windows), their royalty payments to Microsoft can be reduced substantially, because Microsoft must

keep the pricing of DOS and Windows entirely separate.

A third possibility is thereby created. Were IBM to offer system vendors its own PC DOS at a substantially lower cost than Microsoft charges under the new per-copy rules (because Microsoft is also now forbidden to tie in sales of DOS and Windows in any way), OEMs could further reduce their costs by paying IBM a lower price for PC DOS instead of paying Microsoft a higher price for MS-DOS, while still offering Windows for those customers who really want it. Microsoft would then have to lower its royalties for MS-DOS (thereby sacrificing profits) or suffer substantial loss of market share (thereby sacrificing profits, anyway).

If IBM offers OS/2 to vendors for preloads at prices that are lower than what Microsoft is charging for Windows (which appears likely), IBM can actually make it more profitable for OEMs to ship a system preloaded with OS/2 than one preloaded with Windows at the identical price. Again, Microsoft will be caught between the Scylla of losing market share and the Charybdis of having to cut prices. Either way, Microsoft profits will be further reduced.

The bottom line is that the consent decree is more like a solid right hook to Microsoft's jaw than it is a mere slap on the wrist. It is going to hurt Microsoft by substantially reducing its market share and profits. It will also create major new opportunities for OS/2 and will make Microsoft's transition to Chicago far more difficult.

Will Zachmann, a well-known computer-industry analyst, is the founder and president of Canopus Research, based in Duxbury, Mass. He is also a former vice-president for corporate research of International Data Corp. You can reach him on CompuServe at 76004,3657, or on his popular CANOPUS forum.

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Securely Linked Word Processing

AMI PRO 3.0B, LINKRIGHT 1.1, AND THE SECURE WORKPLACE 1.51 BY BRIAN PROFFIT



Ami Pro 3.0b

With almost no fanfare, Lotus Development Corp. is easing a new version of Ami Pro for OS/2 into manufacturing—both as a stand-alone product and incorporated into the SmartSuite. Ordinarily, I wouldn't devote space in my column to a vendor upgrade that is a suffix release and not even a point release. But we were fairly critical of Ami Pro when it was introduced (*OS/2 Magazine*, March 1994, pp. 54-55) and this release addresses the largest problem we mentioned—namely, performance.

Lotus applications (at least the OS/2 versions) have a reputation for being huge and slow. Ami Pro 3.0B weighs in at 5MB before you load any documents. With this version, Lotus has introduced an interesting way to help cut the program load time that this amount of code would require. Upon installation, a program called AMISTART is added to your Startup folder. The first 3MB of Ami Pro are loaded during the boot process. That shortens the load time when you double-click on the Ami Pro icon, because only a couple of megabytes are left to be loaded. It can, however, automatically throw you into swapping—using those 3MB of resources whether or not you ever run Ami Pro. If you don't load Ami Pro frequently, you may choose to

**Lotus wanted
to let people know that
they were still actively
developing in the OS/2
environment.**

remove AMISTART to free up those resources and face the 10 to 20 extra seconds when loading Ami Pro itself. (Note: AMISTART is automatically copied into your \os2\dll subdirectory along with several other files. When will vendors learn to stay out of my OS/2 system directories?)

Keystroke performance improved

Lotus went beyond program load time to address run time. Keyboard responsiveness has been greatly increased, from a level I considered essentially unusable to acceptability.

Other changes include the ability to change style sheets with a macro and to remove a style from your document. Workplace Shell integration has also improved, with new Ami Pro templates for creating documents. In addition, Lotus has added the ability to drop documents on the printer and have Ami Pro load, print the document, and

terminate.

Long filenames are now supported—even on FAT partitions. It must be done manually, but the user can go into a document's Settings notebook and put a long filename into the extended attributes. Doug Benson, Ami Pro for OS/2's product manager, says that one of the top two or three benefits of OS/2, according to many customers, is being able to name a file whatever you want.

Other stability and bug-related changes were made in the new version. For example, they fixed the ability to print Avery mailing labels. However, performance was the main focus and is the main difference you will see.

Glee or flee

If you are already using Ami Pro 3.0A, you will want to take advantage of the free trade-up (with \$10 shipping and handling fee) to this version. If you decided against Ami Pro in the past specifically because of performance, you should take a look at this update. If you had other reasons for rejecting Ami Pro, chances are those reasons are still valid with this release. For example, charting and drawing still isn't included in the OS/2 version.

It is, however, reassuring to see this type of update coming from Lotus. It does address a major problem and was released reasonably quickly. According to Benson, Lotus wanted to let people know

that they were still actively developing in the OS/2 environment.

The Secure Workplace 1.55

Anyone who has ever accidentally selected Arrange from the desktop menu (or had someone else do so for them) knows that the Workplace Shell can bring dangers along with its advantages. The corporate MIS help desk, in particular, may find that the broad range of desktop customization options cause a lot of extra effort when trying to help the user through a problem situation. It is much more difficult to step a user through a sequence of actions over the phone when you cannot be sure which objects are on their desktop or where those objects are. The Secure Workplace addresses these problems and more.

The Secure Workplace is not your typical application. It takes over parts of your operating system automatically during installation. This aspect leads to a weird installation quirk—you must install into a directory that is already in your LIBPATH. So, if you want to install Secure totally in its own directory (which I always recommend over allowing a vendor's product to muck around in my OS/2 directories), you must manually create that directory, add the directory to your LIBPATH, and reboot before starting installation.

New Workplace Shell object classes

Installation automatically replaces your existing desktop with a new secured desktop object. In fact, this change is the only detectable evidence that installation has taken place. No new icons will appear on the desktop itself. Instead, the desktop's pop-up menu is changed with some new items added and the Arrange option removed (see Figure 1), and several pages are added to the desktop's settings notebook.

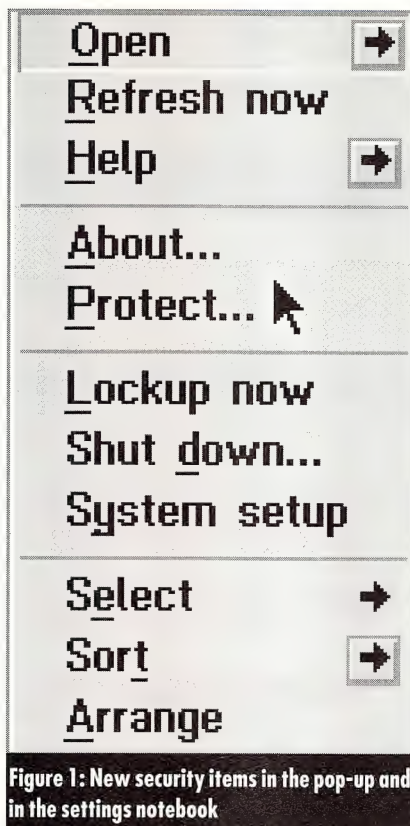


Figure 1: New security items in the pop-up and in the settings notebook

Access to the settings notebook is now password controlled. Syntegration uses an interesting technique that causes the password to change constantly, but in such a way that the user can always determine what it will be.

The Settings notebook now allows you to selectively control whether objects can be copied, moved, shadowed, deleted, renamed, dragged, or selected. You can control whether folders can be sorted or arranged and whether their Details view can be displayed. Individual programs and folders can be protected, requiring password entry to open them. Take note, however, that all of these functions can only be applied to objects created with the new classes that Secure installed. Your existing desktop objects are not secured at all. You must create new folders and program objects using the new Secure templates, or write REXX programs to do so. A corporate MIS desk setting up a standardized desktop for

all users may well find this a worthwhile effort. When guiding users through a problem, it is always easier starting from a known condition. And naturally, fewer problems arise if inexperienced users are prevented from causing themselves problems.

Another feature that helps keep users out of trouble is the Window List Manager, a utility that lets you control what processes appear in the Window List. Hiding Window List entries means they won't appear when the user presses <Ctrl+Esc>, and they won't be selected if the user cycles through windows using <Alt+Esc>. Personally, I'm a firm believer in users having total freedom, but I might be less liberal if I had to support a few hundred of them.

Glee or flee

Besides preventing the occasional accidental Arrange of the desktop (and you should be backing up your .ini files to recover from this situation anyway), the average end user has little use for The Secure Workplace. In the corporate environment, though, the help desk may well find good use for this product. Regardless, I would advise users to think about the form of security they use. After I had to type in a password for the twelfth time in an hour just to open programs and folders, I was ready to re-format the disk.

LinkRight 1.1

It seems that one is never enough, and more and more people are adding laptop machines to increase their computing mobility. With this profusion of machines comes a new demand for fast and easy ways to transfer information between them. Networks are great for desktop systems, and remote gateways can even make dial-up access feasible. That doesn't help when you're on a plane or on the beach, though. For that matter, I haven't seen

many people with Ethernet-ready spare bedrooms.

For some time, people have solved this problem by using Traveling Software's LapLink. It is a DOS product, though, and suffers from a few problems. It can't be used by people who haven't installed DOS support, it doesn't recognize or maintain extended attributes, and it doesn't support long HPFS filenames. LinkRight solves all of these problems and more.

LinkRight is a file-transfer utility that uses serial or parallel ports to copy files between two machines—much more quickly and easily than could be done by disk. As a 32-bit OS/2 program, transfers can take place in the background while you continue other tasks. The multithreaded nature of LinkRight gives it other advantages over LapLink. For example, during transfers you can continue changing directories on both machines

and queuing up more files to be copied.

LinkRight also helps people who use both DOS and OS/2. The remote machine can run a DOS version of the software and LinkRight can retain extended attributes through copies to and from DOS. Problems still occur when transferring long filenames in HPFS to and from FAT copies, but Rightware is working on it.

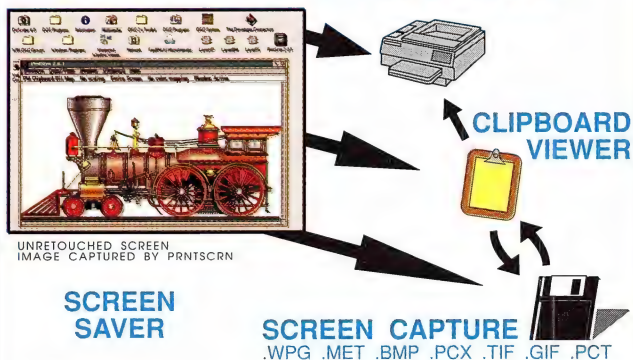
Accuracy of transfer guaranteed

LinkRight offers the option to use both cyclic redundancy checks (CRC) and checksums to verify that the file on the other end was transferred cleanly. Because these verifications are performed via computation on the file instead of a byte-by-byte comparison, they are reasonably fast to perform, and a good insurance policy. On files larger than 1MB, though, the host

machine would occasionally report a communication error while the remote machine was tied up calculating the verification number. Manual intervention is required to clear the error-message pop-up. Everything continued normally from there, but if you're going to start an extremely large transfer and walk away for an hour, you might want to set LinkRight to retry eight times before reporting an error (the default is one retry). Doing so, however, causes a much greater delay if a more serious problem occurs.

Rightware chose to make the status display optional during file transfer. If you need visual reassurance that the data is being copied, you can open a status dialog with progress bars and byte counts to monitor the transfer. I like the fact that this dialog is optional, so I can devote every processor cycle to other tasks most of the time. I'd like to see a Cancel but-

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ton added to this display. If I've started a long transfer, I'd like to be able to cancel it at any time, with the option of canceling immediately (with a warning that the copied file may be incomplete) or as soon as the current file is complete. Rightware has acknowledged this oversight, and plans to correct it.

Batch-mode operation

Of course, if you're going to do large transfers, you should consider using batch mode. With this technique, LinkRight creates a file with a list of the entries that you want to copy. This file can then be used for an automated batch copy of the complete list. This technique has two advantages. If you have a group of files that you routinely copy, the batch file saves you from having to mark those files each time. (Note: directories can be included in the list as well as specific file names.) If an error occurs during the batch transfer, a retry file is created with a list of the files that weren't successfully copied. You can then try a transfer, using the retry file as your batch manager. LinkRight offers detailed logging of events and errors so you can examine the results afterward.

Directory synchronization

LinkRight won't copy over read-only files, so it can't be counted on to make a complete directory image (which can also lead to verification errors as the files on the two machines may not match). I'd like to see an option that allows you to overwrite files regardless of their attributes. In addition, setting LinkRight to copy only newer files will successfully ensure that both machines have the latest versions of every file on each machine. This feature works great in many cases, but if you deleted a file from one machine and not the other, that file will be recopied onto the machine from which it was removed.

If you have

A GROUP OF FILES THAT YOU ROUTINELY COPY, THE BATCH FILE SAVES YOU FROM HAVING TO MARK THOSE FILES EACH TIME.

Another synchronization option allows you to transfer only files that have the archive bits set. This feature is handy if you're backing up your laptop to a larger disk on your desktop system, but it can otherwise be dangerous. Because the archive bits are reset after the transfer, your normal backup program won't know those files need to be saved.

Tuning options

Installation adds the statement `timeslice=33,59` to your `config.sys`. It controls the minimum and maximum number of milliseconds that OS/2 will give to any particular task. By default, OS/2 can vary the range anywhere from 32 to 65,536, dynamically, based on the needs of the programs you are running. You might think that adding this statement would restrict OS/2's flexibility, but the impact is slight. Even so, if you are running a program with unusual timing requirements, you should be aware of this statement.

When I used a packet size of 128B, I found LinkRight to have little impact on the rest of the system. Bumping the packet size up to 1,024B sped up file transfers, but caused a serial mouse to be very unresponsive. That's fine if you're going to start a large transfer and walk away, but if you plan to do your copies in the background, I'd stick with a smaller packet size.

LinkRight also offers file compression to speed transfers. Even if you are using the parallel port, the communication path between the two machines creates a bottleneck. Borrowing the compression algo-

rithm from Proportional Software's DCF/2, LinkRight can take a little more CPU time to greatly decrease the number of bytes being transferred and thus gain a noticeable speed increase.

LRCloner

Users who need to create replica OS/2 systems without the benefit of a network or tape drive have been condemned to hours of drudgery feeding disks to their computers. LinkRight includes a separate program designed to clone OS/2 partitions through the LinkRight cable.

LRCloner is character-based, as opposed to graphical—and for a good reason. If you are cloning OS/2 itself, the remote machine can be booted from OS/2 installation disks, allowing LRCloner to be run directly from the command prompt—you don't have to install OS/2 first. (The disk does have to be partitioned and formatted, of course, which can be done from the boot disks.) You'll have to make a copy of Disk 1, and make some changes so the LinkRight device drivers will be available. Doing so, however, is pretty straightforward, so it shouldn't cause problems. Even so, small command files to automate the process of changing Disk 1 and preparing the target system would be helpful.

The biggest problems you will face concern differences between the two machines. As part of the cloning process, you will have copied video drivers, SCSI drivers, and so on, based on the configuration of the host machine. Where hardware differs on the target, you may need to use OS/2's Selective

Test Drives

Install to correct device driver incompatibilities.

Glee or flee

Most problems that occur are due to the fact that (unlike LapLink) LinkRight cannot assume that it is the only program running on the computer. Consequently, it cannot blithely use up all of the processor time. As a result, although version 1.1 is quite a bit faster than its predecessor, it cannot match LapLink for transfer speed. Still, a transfer rate of around 2MB per minute isn't bad—even while doing things like typing this review in the foreground! Other problems do exist in the currently shipping product, so be sure to apply the patch found in the OS2AVEND forum on CompuServe.

If you've used LapLink, you'll appreciate the features (if not the speed) of LinkRight. It is compatible with LapLink cables, and

includes pin diagrams so you can make your own if you're handy with a soldering iron. If all your machines are already on a network, or you're one of the computationally challenged people who only uses one computer, you probably don't need LinkRight. Otherwise, you would do well to consider committing a second serial or parallel port on your system to the LinkRight cable and taking advantage of this excellent piece of OS/2 programming.

Brian Proffitt has been in the computing industry for 20 years. He was part of IBM's OS/2 team, left IBM to become the director of PC Week's Corporate Labs, and is now the president of Visionary Research. Brian is the author of two books on OS/2, is a contributing editor for OS/2 Developer and OS/2 Magazine. He can be reached on CompuServe at 75300,1466, or Internet 75300.1466@compuserve.com.

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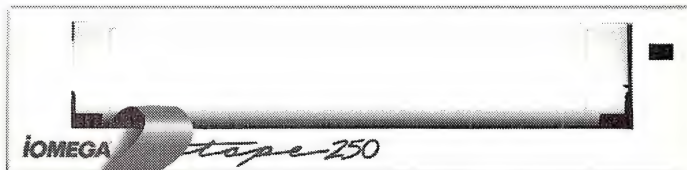
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The Internet offers OS/2 users
places to go and people to meet.
BY STEVEN J. VAUGHAN-NICHOLS

Cruising the Internet

Hear that rumble over the phone line? That's the Internet traffic roaring by your door. You can be out there too, cruising down the information superhighway. All it takes is an OS/2 communications program, so get your modem and jump in, we're off to the Internet.

The Internet is a global network. For the most part, Internet servers are based on UNIX systems, which are bound together by the TCP/IP protocol. While that's all true, it's also sort of like describing a Porsche as a combination of steel and rubber. Both are far more than the sum of their parts.

For you, as a current or future Internet user, the Internet means electronic mail to almost any e-mail system on the planet. It means access to message threads

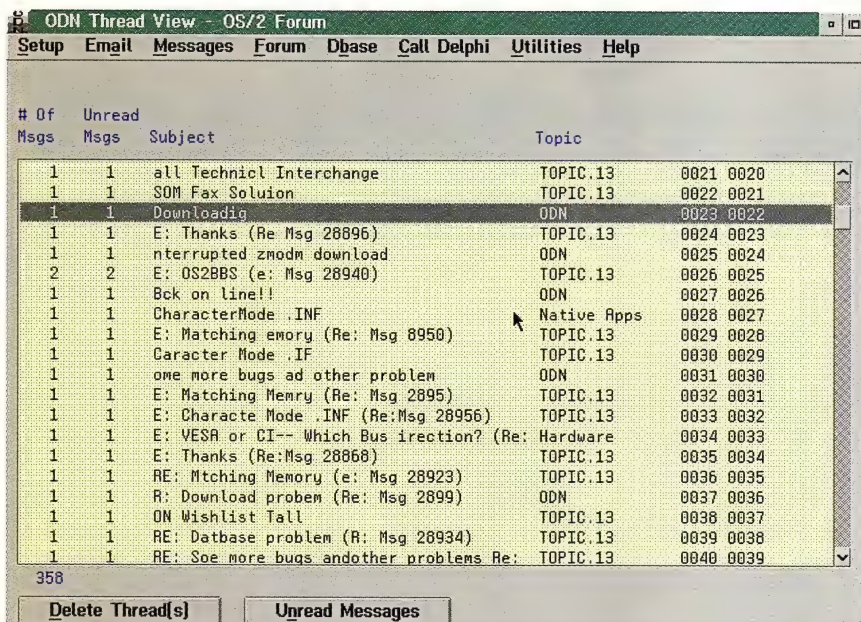


Figure 1: It's not quite ready for the Internet, but the combination of ODN, and Delphi, along with off-line mail and newsgroup readers, will make ODN the low-price leader in OS/2 roads to Usenet.

about almost any subject you can imagine. It means downloadable files from file-transfer protocol (ftp) sites. It means real-time Internet Relay Chat (IRC) conversations across the continent. It means information treasure stored away in WAIS database storerooms. It means a world of graphics, sound, information, and files in one World Wide Web (WWW) of information. And, it's all only a phone call away.

Sounds wonderful, doesn't it? Well, it is wonderful, but it comes at a price: knowledge. No easy-to-use Internet interface software packages are currently available. True, things are much better than they used to be, but you'll still find yourself fighting for Internet riches with character-based user interfaces and flawed Windows interfaces. Still, the prize is worth the price.

Internet on-ramps

You can take one of three main dial-in routes to the Internet using normal phone lines and modems. These are on-line accounts, better known as shell accounts; UNIX-to-

the answer depends on how much you want to get out of the Internet. The Internet offers four basic levels of service:

- **E-mail:** At the first level, which all major on-line services and many bulletin board systems (BBSs) support, Internet access is simply the power to read and send mail to users on other Internet-connected systems. If you look at Internet access this way, no on-line system that's worth its salt is not a part of the Internet.

Do you just want to send notes to your friends, colleagues, or customers? If so, all you need is e-mail access. Businesses with low mail volume that have a need for national or international e-mail connectivity may find that Internet mail is all they need.

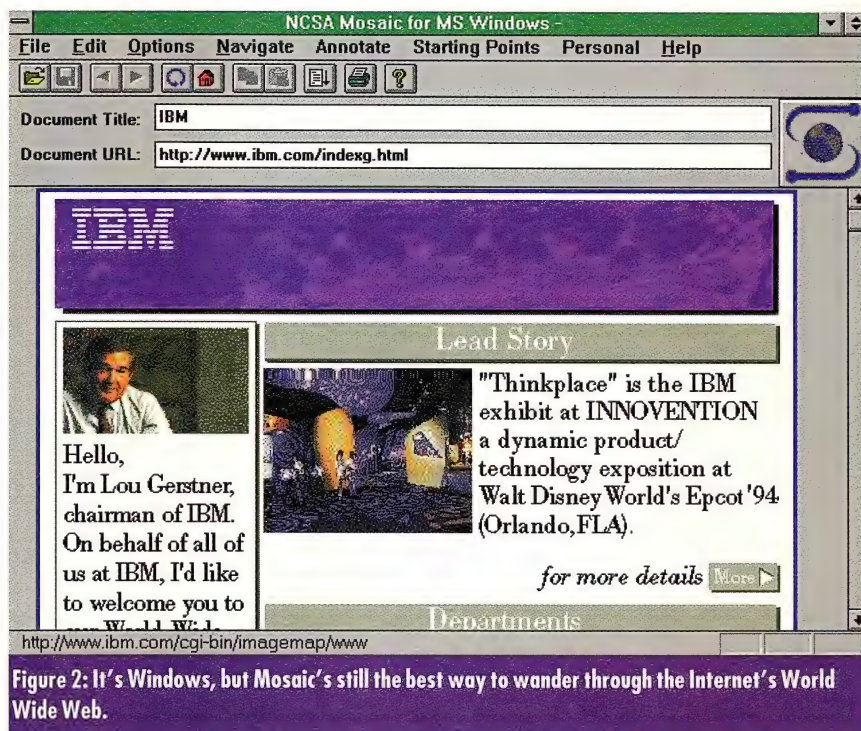


Figure 2: It's Windows, but Mosaic's still the best way to wander through the Internet's World Wide Web.

UNIX copy-protocol (UUCP) accounts; and Internet protocol (IP) connections using serial-line Internet protocol (SLIP) or point-to-point protocol (PPP).

Which one is right for you? Well,

- **Usenet newsgroups:** If you're like most people interested in the net, you'll want more—much more. One of the most popular services is called "Usenet newsgroup" access. Newsgroups

superficially resemble the discussion forums in on-line services, but differ in that there's seldom an all-powerful systems operator (sysop) or moderator to monitor the discussion. As a result, topic-drift, when an on-line conversation no longer has a thing to do with its subject, and flame wars, angry on-line arguments, are far too common.

Services that provide both newsgroups and mail are said to be part of Usenet—a superset of the Internet. On-line services that offer UUCP and shell accounts give you Usenet access.

If you're interested in a specific subject, chances are you can find a Usenet newsgroup for it. Business Internet users may find newsgroups, as a whole, not very interesting. Still, the ClariNet newsgroups, which carry news from AP and Reuters, and the technical newsgroups, which cover the ins and outs of specific technologies or software, can be very valuable to business users.

As an OS/2 user, you have access to numerous newsgroups, including:

- **comp.os.os2.advocacy:** For cheering OS/2 on.
- **comp.os.os2.announce:** For the latest official OS/2 news.
- **comp.os.os2.apps:** For OS/2 application discussions.
- **comp.os.os2.beta:** For OS/2 beta conversations.
- **comp.os.os2.bugs:** For hashing out OS/2 bugs.
- **comp.os.os2.networking:** For LAN administrators.
- **comp.os.os2.networking.tcp-ip:** For TCP/IP users.
- **comp.os.os2.programmer:** For the OS/2 programmer.
- **comp.os.os2.setup:** For OS/2 installation help.

- **File transfer:** At the third level, you can use Internet programs such as archie, ftp, telnet, and

WAIS with a shell account. This kind of account lets you run these programs from and on the host system.

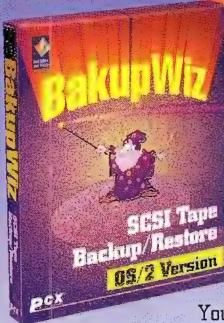
Here, your computer is not part of the Internet. Your OS/2 system is simply acting as a terminal to an Internet-connected computer. As a result, with most Internet providers, you'll need to manually move information and

files from the Internet site to your PC. For example, once you've ftp-ed a file to your Internet computer, you'll then need to take a second step of downloading it to your computer before you can use it.

- **Full membership:** Finally, there are services that will let your computer become part of the Internet. These services require

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Reader Service No. 19

that you're running TCP/IP on your OS/2 machine. The advantage here is that you can use the Internet's full range of tools. These Internet programs include ftp, telnet, and WWW browsers.

There are two problems with this top level of service. First, SLIP and PPP accounts tend to be expensive. You'll need to shop

around to find a deal that won't break your wallet. Second, hooking up an IP connection is not easy. If you don't consider yourself a power user, don't consider installing an IP connection.

Finding a Provider

You can take one of two approaches to getting newsgroup or e-mail

access to the Internet. The cheapest method is usually to find a local Internet provider. That job used to be easier said than done. Today, if you have access to any net-capable e-mail account, it's not really hard at all. What you'll need to do is to send a message to the Internet address *info-deli-server@netcom.com* with the subject line "Send PDIAL."

Internet Vocabulary 101

Feeling superior to common DOS users because you know what HPFS means? Well, get ready for deflation. Like OS/2, the Internet and UNIX, the operating system underlying it, have a vocabulary all their own. For better or worse, you'll need to learn a lot more application-specific language than you did when learning OS/2. Here are the bare basics:

Archie: Archie is a client-server database program that tracks all anonymous ftp files. To use it, you run an archie client from your local machine. Archie then connects with one of the archie server databases, and you can then track down ftp-able files.

FAQ: Frequently asked question lists are just that: questions and answers for new users of some application or product. Keep in mind that "new" is a relative term. What's old hat to you is new and complex to someone else. Normally, FAQs are posted in the newsgroups to which they pertain. For example, if you want to know what Crow, the robot from Mystery Science Theater 3000, is made of, the FAQ from *bionet.agroforestry* is not going to help. The right answer, for all you MST3K fans out there, can be found in the *alt.tv.mst3k* FAQ.

Flame: A loud on-line argument in a Usenet group in which insult has replaced insight.

Ftp: File-transfer protocol is like Z-Modem or Kermit in that it is a data-transfer protocol. Unlike those two, ftp can only be used with Internet protocol connections and not on ordinary dial-up connections. Ftp is *the* way to transfer files over the Internet.

GNU: GNU's not UNIX, which is a recursive pun. If you think it's funny, congratulations, you'll like learning UNIX. The reason I bring it up is that GNU software is also always first-class freeware.

Gopher: Gopher is a menu-driven client-server database application. Named after its home University of Minnesota mascot, the name also gives you a good hint as to what it does. Gopher menus lead you to Internet resources ranging from on-line libraries to ftp sites to interesting text files and other gophers. Each gopher server has its own unique personality and its own collection of resources.

Internet: The more than three million computers tied together around the world via Internet protocol (IP) networking protocols.

Newsgroups: Groups of messages that are loosely bound (sometimes very loosely) to a single subject that are carried for public distribution over the Usenet.

PPP: Point-to-point protocol is a popular IP protocol that works with normal modems and phone connections.

RFC-822: The Internet e-mail standard. Addresses in this format always look like *user_name@someplace.place*. For example, *sjvn@access.digex.net* is an RFC-822 for yours truly that reflects that the Internet site is devoted strictly to the Internet, while *sjvn@well.sf.ca.us* is another valid Internet address that tells the educated reader that I have an account on the WELL, which is located in San Francisco, Calif., U.S.A.

SLIP: The serial-line Internet protocol is the other popular protocol for connecting directly with the Internet via an ordinary phone and dial-up connection.

TCP/IP: Transmission-control protocol/Internet protocol. The network protocol that provides the virtual glue that holds the Internet together.

Telnet: The Internet program for logging onto a remote computer. For example, from my *access.digex.net* account I can telnet to my *well.sf.ca.us* account instead of having to go through SprintNet make a long-distance phone call.

Usenet: Usenet is bigger than you can imagine. It's bigger than I can imagine and I get paid to help map and explain it. One description that not too many people will get up in arms about, is that it's any computer system that receives or sends newsgroup messages and RFC-822 mail on a regular basis.

Veronica: Gopher sounds great doesn't it? And it is, until you try to find something that's not available from the gopher servers within reach. That's where veronica steps in. This client-server DBMS tracks gopher menu items and makes them keyword-searchable. Let's look at an example, you want to find out about BEHEMOTH, Steve Roberts' Internet-connected bicycle. Chances are you could wander for days in gopherspace looking for the gopher at *microship.ucsd.edu*, which has a file about BEHEMOTH, but veronica will find it for you in less time than it took you to read this far in the article. BEHEMOTH, by the by, is quite real. The acronym stands for Big Electronic Human-Energized Machine...Only Too Heavy.

WAIS: Another client-server database system, WAIS provides access to full text-indexed documents. As an example of the difference between this and the others, WAIS can find you a word in an on-line book, while veronica could find you a gopher with a menu choice of the book title.

WWW: The World Wide Web is a world distributed hypertext and hypermedia database. In the Web, images and text can be hyperlinks to other images and text. Sometimes, these links lead to other Internet search tools like gopher, at other times they lead to practically anything that can be reduced to bits and bytes.

WWW Browser: To use the Web, you must have a browser program. The most popular of these is Mosaic.


```

Pmcomm - Digex - 2400
File Edit Connect Transfer Hangup! Options Macros Help
Reformatting page. Wait... done
LS(IL) Utilities LS(IL)
NAME
ls, dir, vdir - list contents of directories
SYNOPSIS
ls [-abdefgiklnopqrstuxABCFGILNORSUX178] [-w cols]
[-T cols] [-I pattern] [--directory] [--all] [--escape]
[--inode] [--kilobytes] [--no-group] [--numeric-uid-gid]
[--hide-control-chars] [--reverse] [--size] [--width=cols]
[--tabsize=cols] [--almost-all] [--ignore-backups] /[--clas-
sify] [--ignore=pattern] [--full-time] [--literal]
[--dereference] [--quote-name] [--file-type] [--recursive]
[--sort={none,time,size,extension}]
[--format={long,verbose,comas,across,vertical,single-
column}] [--time={atime,access,use,ctime,status}]
[--color[={yes,no,tty}]] [--colour[={yes,no,tty}]] [--7bit]
[--8bit] [--help] [--version] [path...]
DESCRIPTION
This manual page documents the GNU version of ls. dir and
--More-- (6%)
Connect time 00:00 VT100 Fri Aug 05 17:49

```

Figure 3: PMComm is a fine terminal program, and odds are you'll need one for accessing local Internet providers. Here, in way of warning, is the first page of the on-line help for UNIX's directory display command. It's not as bad as it looks, but it's no GUI either.

In less time than it took you to read to this point in the article, you'll receive a list of public Internet access providers, complete with company names, addresses, phone numbers, some pricing information, and the area codes each covers by return post.

The vast majority of these providers present you with only character-based interfaces. Those that provide GUIs only offer Windows interfaces. Some will work under Win-OS/2, but let the buyer beware. Few of these companies have large technical support staffs and fewer still have personnel who understand OS/2.

No services, at this time, offer native OS/2 Workplace Shell interfaces. To use any of them, your safest bet is to use a generic communications program and work with the ASCII interface.

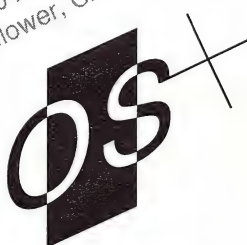


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If you're lucky, your local Internet provider will have a character-based menu system. Yes, it's a step back to the dark ages of computing, but the alternative is usually the unadorned UNIX-character user interface. If that's the case, just bite the bullet and start learning UNIX. A good short introduction is Grace Todino, John Strang and Jerry Peek's *Learning the UNIX Operating System*.

Your best alternative is to go with one of the national on-line services. America Online, CompuServe, and Delphi all offer at least mail and newsgroup services. Each also offers at least some shell-account services. All the major services are adding Internet capacities as fast as they can drive their engineers, so you'll need to call them to see what level of Internet connectivity each is currently offering.

America Online requires a Windows interface, but their front-end program runs adequately under a Win-OS/2 session. BIX also offers a Windows front-end, InterNav 2.0, but with its own communications driver, it's a bear to make work in a Win-OS/2 session. Fortunately, you can also access BIX via a character-based menu interface.

CompuServe, however, is blessed with an excellent OS/2 user interface: Creative Systems Programming Corp.'s Golden CommPass (reviewed in *OS/2 Magazine*, February 1994, p. 24). To use CompuServe's Internet tools with Golden CommPass, or from a terminal program, type GO MAIL for Internet-capable e-mail. Usenet groups are also available via GO USENET.

Delphi also has an OS/2 interface program, Terry Roller's ODN, but the currently available version of this shareware off-line reader doesn't support Usenet newsgroups. The next version, which should be out by the time you read this article, should support newsgroups. To get a copy of the pro-

gram, use the GO CUSTOM 41 command in Delphi. It will bring you to the OS/2 forum where you'll find a zipped copy of the program in the file library.

UUCP

You can also get access to Usenet by using UUCP programs. Once again, no native OS/2 programs are currently available, so you'll have to make do with Windows and MS-DOS programs.

UUCP services have one shining virtue: they're often the cheapest way to get Usenet access. With a UUCP front-end, you'll be doing all your mail and news reading off-line. UUCP programs charge up to Internet provider computers and download messages and news articles as fast as your modem can handle them so that you can then read and reply to them at your leisure.

These services are only available from Internet providers. None of the national on-line services support UUCP, and it's unlikely that they ever will. Two Windows programs that work quite contentedly under Win-OS/2 are MKS Internet Anywhere from Mortice Kern Systems and WinNet from Computer Witchcraft.

Shell accounts

For access to most other Internet services, you must get a shell account from an Internet provider. All the caveats about Usenet accounts on Internet providers hold true here. The one difference is that you're going to need to know even more UNIX. In particular, you'll want to learn more aboutarchie, ftp, gopher, telnet, veronica, and WAIS.

Archie is a distributed database program that tracks downloadable files. Ftp actually moves the files from hither to yon, but finding the file you want is wherearchie comes in.

You'll often see ftp referred to as "anonymous ftp." That's because,

to use ftp at a public site, the convention is to login as "anonymous" with the password of your e-mail address. One such site that you'll want to visit immediately is either tp-os2.cdrom.com or ftp-os2.nmsu.edu. There, among other things, you'll find the latest edition of the OS/2 frequently asked questions (FAQ) list—perhaps the most complete OS/2 question-and-answer document you'll ever find.

Gopher, veronica, and WAIS are menu-driven Internet information programs. Gopher puts Internet resources into a menu format. Of course, if you don't know which gopher to go to, you can waste a lot of time going from one gopher hole to another. That's where veronica steps in. This program allows you to keyword search through all gopher menus. Finally, WAIS enables you to search through indexed full-text documents on the Internet.

IP connections

To establish an IP connection with the net, which enables you to run the programs I just mentioned and others, you need a copy of IBM's TCP/IP 2.0 for OS/2 on your local machine. TCP/IP 2.0 gives you the basic TCP/IP protocols and a number of TCP/IP Internet programs. These include an E-mail tool, an ftp client, and a telnet client for logging on to remote computers.

If you're interested enough in the Internet to want an IP connection, what you probably really want more than anything else is a WWW browser. And, given a choice, what you really want is probably Mosaic. Well, first the bad news, you're not going to get an OS/2 Mosaic from its creator, the National Center for SuperComputer Applications. Rumors abound that IBM or other vendors will be releasing a WWW browser but, so far, there's been no fire to go with the smoke.

Until some company does strike a spark, you can use the Windows version of Mosaic as long as it's no

later than Mosaic 2.0 Alpha 2. Later versions of Mosaic use the Windows 32-bit extension, Win32s, and will not run on OS/2 2.1 or earlier. This edition of Mosaic is available on CIS in the OS2USERS forum file library and on the Internet at the anonymous ftp site: <ftp.ncsa.uiuc.edu>

Logout

I've just scratched the surface of the potential and complexity of the Internet. It's not easy to get to as an OS/2 user, but your efforts will be rewarded if you elect to give it a shot. For more information try: *Riding the Internet Highway Deluxe Edition* by Sharon Fisher, Rob Tidrow and Steven Vaughan-Nichols and Daniel Dern's *The Internet Guide for New Users*. See you on the Net!

Steven J. Vaughan-Nichols is a freelance writer working out of Lanham, MD. He can be contacted via Internet as sjvn@access.digex.net.

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by Grace Todino, John Strang, and Jerry Peek
O'Reilly & Associates
(707) 829-0515, (800) 338-6887

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by Sharon Fisher, Rob Tidrow,
and Steven Vaughan-Nichols
New Riders Publishing
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The Internet Guide for New Users (\$27.95)

By Daniel Dern
McGraw-Hill Professional Computing
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archie

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Mosaic 2.0 Alpha 2

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Reader Service No. 21

Opening Up OpenDoc

How OpenDoc technology should help us create smarter desktop objects. **By Robert Orfali and Dan Harkey**

As an OS/2 Workplace Shell user, you are already familiar with the power of Object-Oriented User Interfaces (OOUIs). But, as great as the Workplace Shell is, it's only a warm-up exercise for OpenDoc—the next leap forward in how we interact with the desktop, create applications, and deploy them. OpenDoc—especially when used with Taligent part frameworks—will transform your Workplace Shell desktops into visual stages where smart objects collaborate to make things happen. You get to be the orchestrator of this show.

From Workplace Shell to OpenDoc

As a state-of-the-art OOUI, the Workplace Shell encourages you to interact with visual objects via direct mouse manipulation using drag-and-drop. The Workplace Shell lets you act on a visual object via its pop-up menu or by double-clicking on it. Objects can be grouped into containers—the Workplace Shell itself is a top-level container. Finally, you can create new objects by selecting a cookie-cutter form from the template container. All this stuff is great, and it explains why OS/2 is so popular among power users.

So what does OpenDoc do to make it even better? Simply put, OpenDoc provides the next layer of technology for creating smarter desktop objects, which are now called “parts.” When it comes to interpart collaboration, OpenDoc parts are smarter than today's desktop objects in four areas:

- They know how to share visual containers.
- They can respond to scripting commands and perform automation.
- They can store (or embed) their persistent data in a common file.
- They know how to communicate with each other to get something done.

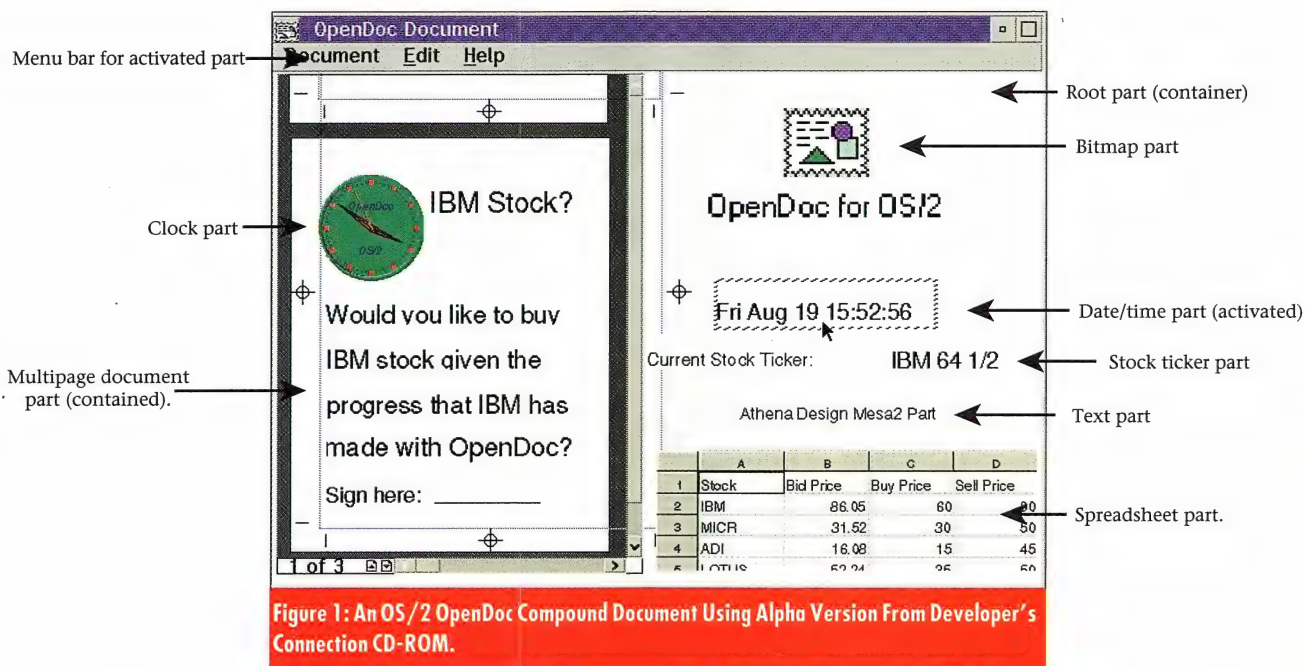
OpenDoc parts that are created using Taligent frameworks have added smarts when it comes to collaboration. These Taligent OpenDoc parts use some of their common ancestry—Taligent calls this “shared DNA”—to negotiate interactions and work seamlessly on common tasks. In a nutshell, OOUIs are starting to become more than just a pretty face. We're going to see smarter visual objects with more semantic depth. They will start to act more like real objects, turning the desktop into a virtual reality that's more akin to arcade games than daddy's old computer.

Containers and compound documents

Like today's Workplace Shell, OpenDoc provides an infrastructure for managing objects and container objects, and an OpenDoc container can contain embedded containers as well as simple parts. However, what OpenDoc technology brings to the Workplace Shell are smarter containers and parts that know how to negotiate for their share of visual real-estate. The result is that OpenDoc parts appear in containers with seamless boundaries between them just like you would expect, as shown in Figure 1.

You will be able to drag OpenDoc parts out of a template folder—they call it “stationery”—and lay them out inside a visual container just like you do with a page-layout program. Parts can represent almost any type of data—including text, movies, sound clips, clocks, calendars, spreadsheets, and things we haven't even dreamt of. You can visually overlap parts, embed them within each other, and lay them out in any geometric configuration that suits your fancy. OpenDoc even supports non-rectangular geometric shapes, which means you can have a round clock in a document with text flowing around it—just like you would expect.

Because of its seamless operation, OpenDoc can be



used to create all sorts of interesting containers, such as compound documents and database front-end forms. The beauty is that the end user can put together these applications from desktop parts—no programming is required. To create a compound document, you simply open a file to obtain a “root part,” then populate it with parts using drag-and-drop. You can assemble and lay out your document with many kinds of parts, which are all concurrently active. An OpenDoc document becomes a collection of active parts. Data structures, such as text, graphics, spreadsheets, movie clips, and audio, are all live within the document.

It's important to note that, with an OpenDoc document, you're not dealing with “dead bits” that are created outside the application and pasted into a file. Instead, every part can be edited in place directly where you placed it within the document. When you click on a part, you automatically get an editor, menus, and tools that let you work on that part from within the document. If you move to a different part, you get a different editor.

OpenDoc's in-place editing is a form of direct manipulation. It's similar to the pop-up menus that appear when you right-click on Workplace Shell objects, except that you get to work on the data wherever you placed it within the document. It also gives your container a seamless look that makes the disparate parts look like they were designed to work together from the very start. Each part has its own editor. The OpenDoc compound document integrates many different kinds of information, each with its own editor that was written by programmers who knew nothing about each other. Parts are the boundaries within the document where one kind of

content ends and another begins. Documents can be very complex; for example, the desktop itself could consist of a complex hierarchy of documents within documents. Folders are subdocuments within the Desktop and those folders contain further subdocuments.

Containers for all occasions

The compound-document metaphor is a container abstraction that's familiar to today's desktop users—everything you build, manipulate, and store is a document. However, the document metaphor is just one example of a root part container into which other parts are embedded. It's easy to imagine other metaphors for visual containers into which parts can be dragged, dropped, rearranged, and manipulated to suit a user's needs. Examples of possible OpenDoc containers are business forms, database front-ends, floor plans, desktops, garden plots, and any visual representation that can be used as a container of parts.

We anticipate that software developers will provide “designer containers” to work hand-in-glove with the parts they contain. For example, an airplane container can be populated with parts representing seats, passengers, crew, luggage, and so on. OpenDoc will encourage new levels of direct manipulation on the desktop; end-users will create custom applications by choosing a container and populating it with active parts using drag-and-drop. The parts can reside on the desktop or on servers anywhere on the network. Imagine your desktop accessing multiple data sources through multiple client/server connections from within a single visual container or document. Kurt Piersol, Apple Computer's OpenDoc architect, calls it “an entire information sys-

tem in a document." Welcome to the brave new world of software components.

Scripting and automation

It almost goes without saying that automation freaks—including scripters, power users, system integrators, and IS shops—will want to do more with parts and containers

than just visual assembly. Yes, somebody will always create "magic pushbuttons" that set into motion a complicated set of interpart commands. So, how is scripting done across parts that know nothing of each other? The answer is through OpenDoc's Open Scripting Architecture (OSA), which defines how containers and parts communicate

with each other using an event registry, which contains lists of commands, called verbs, that parts will respond to. OpenDoc lets you transparently script any part within a container. A single line of script can span across multiple part boundaries using familiar document notations that specify a part's containment hierarchy.

OpenDoc Under the Covers

OpenDoc is a set of APIs and software for building compound documents. It is similar in scope and function to OLE 2, but it comes from Apple rather than Microsoft. Apple developed the technology, and has gathered partners to form a consortium for the care and feeding of this technology across multiple platforms. In September 1993, Apple—along with IBM, Novell, Oracle, Taligent, SunSoft, WordPerfect, and Xerox—announced the Components Integration Laboratories (CI Labs). The purpose of CI Labs is to establish, promote, and certify OpenDoc and related compound-document technologies. CI Labs technology will eventually integrate multimedia, three-dimensional models, text, graphics and other types of information in any application, as shown in Figure 1.

The initial CI Labs technology includes Apple's OpenDoc software for Windows, OS/2, Macintosh, and UNIX, Apple's Bento technology for the storage and interchange of multimedia information, Apple's Open Scripting Architecture (OSA) for the coexistence of multiple scripting systems, and IBM's System Object Model (SOM) architecture, a platform and language-independent run-time mechanism for dynamic object linking. We offer Figure 2 as our best shot for what constitutes OpenDoc. Let's go over the constituent pieces and see how they relate:

- **SOM** provides local and remote interoperability for OpenDoc objects. SOM is a language-independent CORBA-compliant protocol for objects that communicate in a single address space or across address spaces on the same machine. SOM allows objects to communicate across networks—it's a CORBA-compliant Object Request Broker (ORB).
- **Bento Object Containers** provide a system of structured files, with each file containing many streams. Each container can contain a number of document objects; each object can contain one or more draft objects. Bento—named after Japanese plates with compartments for different foods—defines a container format that can be used in files, network streams, clipboards, and so on. Bento also defines an API that reads and writes the container format very efficiently. The Bento API is implemented in a library that currently runs on Macintosh, Windows, OS/2, and several UNIX systems.

A Bento container allows applications to store and retrieve collections of objects (both streams and piece-based). The container format is platform-neutral and can store data, regardless of its content. In a Bento document, each object has a persistent ID that moves with it from system to system. Bento also supports references between objects in different files (documents). If there are several drafts of a docu-

ment, Bento only stores the incremental changes. All this makes Bento a good protocol for the interchange of compound documents or groups of objects between different platforms and applications.

- **OpenDoc Compound Document Management** provides a container in which parts can be inserted. Parts are the fundamental building block of OpenDoc. Part handlers are the independent programs that manipulate and display a part type. Part handlers are divided into two types: editors and viewers. Part editors display a part's contents and provide a user interface for modifying that content. Part viewers allow a user to display and print a part's content but not edit it. Viewers are usually distributed for free, but you will pay for the editors. Frames are areas of the display that represent a part. They also represent the part in the negotiations for space during the layout of a document. Bento gives each part its own data stream in persistent store.

- **Open Scripting Architecture (OSA)** is modeled on the Mac's AppleScript. It defines about 14 polymorphic commands that tell a part what

to do. For example, "next" can mean the next cell or the next word, depending on the type of part that receives the command. Each part is scriptable, allowing users to customize their applications with user-specific tasks. This approach is called content-centered scripting. A part handler must be prepared to provide the list of objects it contains and the operations it supports at run time. In addition, OpenDoc can deliver event messages from the scripting system to the part handlers. Scripting provides a medium for coordinating the work of parts in documents, and allows users and parts to work together to perform tasks. OpenDoc supports recordable macros that allow an application to record a user's actions and then save them to a user's preferred scripting language for later use.

CI Labs plans to make source code available to the industry for these technologies, and its sponsors plan to support the technologies across multiple platforms. Initial target platforms include Microsoft Windows, Macintosh, and OS/2, with plans to support UNIX systems. The CI Labs Consortium plans to make OpenDoc compatible with OLE. The translation layers are being developed by WordPerfect with help from Borland, Apple, and Lotus. The OpenDoc products will start becoming widely available in 1995.

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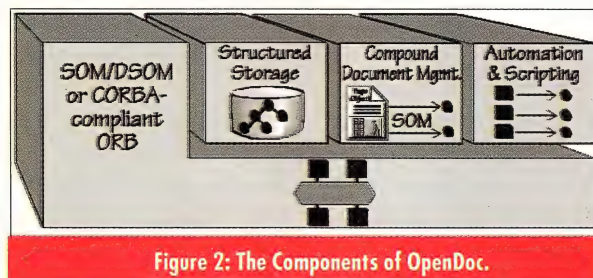


Figure 2: The Components of OpenDoc.

OpenDoc supports the creation of language-independent scripting components. Different platforms will supply their scripting language(s) of choice such as REXX, Basic, or AppleScript. An OpenDoc part will respond to the same events regardless of which scripting language is used. A side benefit is that OpenDoc's events can easily be captured and recorded for later playback. In summary, OpenDoc lets you manipulate a container and parts embedded within it using the scripting language of your choice. It provides a powerful tool for coordinating the behavior of your parts and lets you create smart documents for all occasions.

Storing and shipping, drafts, and cliques

Once you've assembled a document (a container) with its diverse set of parts, you'll want to store that document and even distribute it to

other users. OpenDoc provides the technology for storing a container made up of multiple parts and data types in a single document file. OpenDoc gives each part its own storage stream within the file. Parts can reference (or link) to other parts within the same document or even outside the document on diverse networks and platforms. In theory, OpenDoc should make it possible to distribute multimedia documents across multiple operating systems (assuming that the data type representations are the same and multiplatform part editors are available).

Each document starts out as a unique draft, which is a unique version of the document you are working on. When you modify a document, OpenDoc will automatically create a new draft and archive the old one. A document consists of a set of drafts. All this archiving and draft management is handled transparently by the system. The good

news is that drafts don't require prohibitive space overheads—they only store the parts of the document that have changed. Many users can share a document by giving each their own draft. However, you'll need to manually reconcile the different drafts of the document.

Cliques are groups of parts that act like a suite. They do this by defining protocols that allow them to collaborate on a task. The protocols can be implemented via predefined events (the same semantic events used for scripting) or via direct object-to-object interactions. Objects expose their functions using an interface-definition language and a run-time interface repository). OpenDoc's interpart communications rely on the System Object Model (SOM)—a standard for interobject communications (see "OpenDoc Under the Covers" on p. 40). Cliques will form the basis for collaborative desktops con-



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sisting of very smart parts. Standard OpenDoc depends on collaboration and is organized for it. However, OpenDoc parts created using the Taligent frameworks are the ultimate clique. They collaborate by creating a common model at the semantic level and inherit collaborative behavior from their parent classes. You can think of Taligent-derived parts as being prewired to work together at many levels.

What about OLE?

Parts require standards that let them play together. OpenDoc provides such a standard. The bad news is that, as usual, our industry has more than one standard to choose from. In this case, the other standard for parts and containers is Microsoft's Object Linking and Embedding, better known as OLE. So how do we avoid a Beta versus VHS situation? The good news is that OpenDoc parts and containers are OLE-compatible. You should be able to place OpenDoc parts in OLE containers and vice versa. OpenDoc applications are OLE-compatible because they are also OLE applications. WordPerfect is demonstrating OpenDoc support of premiere OLE applications including Microsoft Word and Excel and Shapeware's Visio. So, it may be a case where you can have your cake and eat it too.

The parts revolution?

Today's applications are monolithic; they contain every possible feature you might use whether or not you really want it. Most of us use less than a tenth of an application's features—the rest of the features simply add complexity and bulk. Typically, to get the new features and technology that we really need, we must wait forever for upgrades or replacements. This is because, with every new release, vendors must bring forward all the hundreds of features in an application, leading to long and costly development cycles. Vendors take the "shotgun"

approach because they don't know which features you need and so they try to be all things to all people.

To find a set of collaborative applications today, you must buy a suite, which locks you into a single vendor. Outside of suites, it's almost impossible to mix and match applications. And don't even think of building a custom system from existing desktop applications.

OpenDoc (and OLE) are the first step in the component software revolution. Ultimately, they will help break down monolithic applications into components that can be assembled into suites by the vendors themselves, third-party integrators, or IS shops. If you're a Workplace Shell power user—that is, you know how to create objects from templates and personalize them using a Settings notebook—you'll find it second nature to assemble your own personalized applications using off-the-shelf OpenDoc parts and containers. If you hate messing around with computers, you'll probably let somebody else assemble OpenDoc containers for you and fill them with live parts. The good news is that it won't cost an arm and a leg to have a custom document-centric application built.

Initially, those parts will be provided by large application vendors. Some are already deconstructing their code monoliths into more manageable parts to gain efficiencies and reach more task-specific markets. OpenDoc will level the playing field by removing barriers to entry for the small software developers: their parts will be able to interoperate with the larger applications sold by the big guys. With the help of visual tools built on cross-platform frameworks, developers will be able to create parts that can be compiled to run on OS/2, Windows, and Macintosh. These tools will further remove barriers to entry and help create a cottage industry for OpenDoc parts.

OpenDoc will create new oppor-

tunities for software part distributors. These are the people that will sell you mail-order catalogs of software parts and distribute them via CD-ROM, the Internet, and other media. For example, the Object Management Group (OMG) plans to offer an on-line Information Brokerage for parts in early 1995. Vendors will be able to list their components within the Information Brokerage, along with descriptive information and product specifications. Consumers will be able to download parts, take them for a test drive, and purchase them at any time of the day or night. We expect many other brokers to jump into the parts distribution business and offer all types of value-added services such as parts certification, virus detection, support, suite validation, and so on.

Where are the suites?

What will application suites look like? In the world of component software, suites are simply factory-assembled parts. Suites will likely be offered cafeteria-style to suit all needs:

- **Preassembled suites** are wired components prepackaged for turn-key applications—for example, a dentist-office suite. These suites will be listed in catalogs.
- **Built-to order-suites** let you choose your parts, containers, and the platform they run on from a multivendor parts catalog. Value-added resellers will then assemble and test a suite to your specification and ship it within hours.
- **Client/Server suites** can be assembled from networked parts and tested for a customer's environment. It can be a great value-added service.

In summary, OpenDoc and the parts business offer the potential to revolutionize the desktop and the way applications are created, assem-

bled, and deployed. The ramifications will also be felt in networked client/server software. It's a revolution that may help unleash a new era of creativity and entrepreneurship. If nothing else, it can help create lots of new OS/2 applications by lowering the barriers to entry for developers and suite integrators.

Apple, Novell/WordPerfect, and IBM have shipped over 12,000 OpenDoc Alpha Kits for Macintosh, Windows, and OS/2. Final code for the Macintosh and Windows platforms is due in the fourth quarter of 1994. Final code for OS/2 is due in the first quarter of 1995. A major OS/2 OpenDoc Beta is expected in the fourth quarter of 1994. The OS/2 Taligent Early Developer's Kit is due this fall. An AIX version is available now from Taligent. IBM intends to provide built-in support for OpenDoc and Taligent in a new release of OS/2 slated to ship in Mid-1995. The new OS/2 version will

integrate OpenDoc and Taligent into the Workplace Shell and permit part exchanges with OLE applications running Windows under OS/2. OpenDoc Alphas and Betas are available through the Developer Connection CD (Devcons). You can sign up for the IBM CD-ROM mailings at (800) 633-8266.

Bob Orfali and Dan Harkey are the authors of the bestselling book Client/Server Programming with OS/2 (Van Nostrand Reinhold, 1993), Essential Client/Server Survival Guide (Van Nostrand Reinhold, 1994), and Client/Server Survival Guide with OS/2 (Van Nostrand Reinhold, 1994). Orfali and Harkey have been developing client/server applications and tools for the last eight years. They currently work on the application of distributed object technology. Orfali and Harkey are affiliated with IBM's Personal Software

Products division, and work in the San Francisco Bay Area.

RESOURCES

OS/2 OpenDoc Developer's Toolkit

Available by ordering the OS/2 Developer Connection CD-ROM (\$199 for a one-year subscription)
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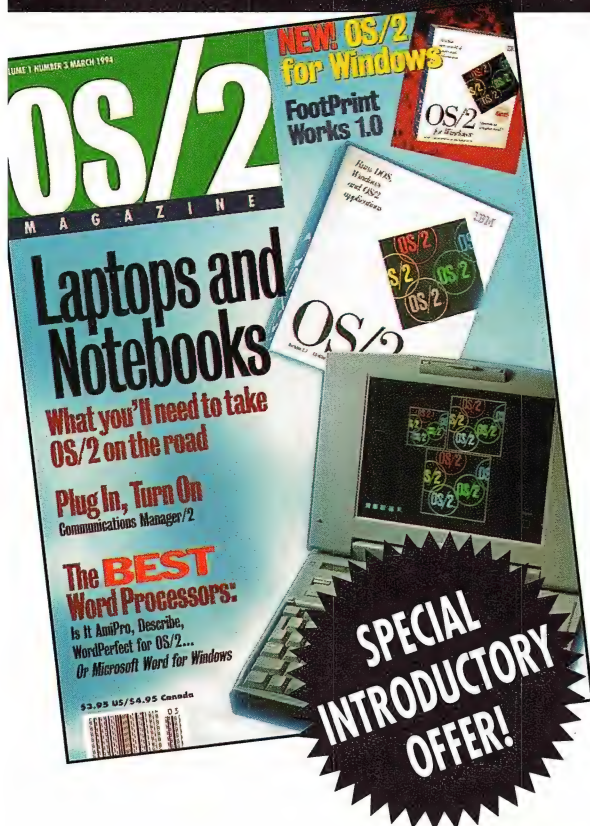
Client/Server Survival Guide with OS/2 (\$39.95)

by Robert Orfali and Dan Harkey
Van Nostrand Reinhold
(800) 842-3636
IBM publication number SR28-5494
(This book contains a general introduction of OpenDoc, OLE, DSOM, CORBA, and Taligent.)
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Preserving your Desktop

Three tools to help save and restore your customized Workplace Shell. **BY LENNY BAILES**

One of the great benefits of OS/2 is its wealth of opportunity for customization. That's the good news; the bad news is that this increased flexibility means increased complexity—and the possible loss of customizations you have made.

Take DOS, for example. In a pinch, you can boot DOS without *config.sys*, *autoexec.bat*, or *.ini* files of any kind. Of course, OS/2 gives you better access to your programs and data files than DOS, but there's a maintenance tradeoff: the powerful OS/2 engine is dependent upon its configuration files. Modifying your system defaults or recovering your custom configurations from a crash is a slower process.

You've probably seen that IBM provides some OS/2 maintenance procedures in the *Installation Guide* and *Using the Operating System* manuals. But these techniques are cumbersome and, what's more, only partially protect your precious system settings. The good news is that freeware, shareware, and commercial utilities for OS/2 can make protecting the Workplace Shell Desktop a minor chore.

Common disaster scenarios among OS/2 novices start with experimentally changing parameters in *config.sys*, or attempting to install third-party drivers. In the process of following the hardware maker's convoluted instructions something goes wrong: the system hangs in the middle of running *config.sys*. Or when OS/2 boots into the Workplace Shell, all of the folders and icons have vanished.

Another pitfall: inexperienced users may attempt to run a system backup or restore files from a DOS session.

Common disaster scenarios among OS/2 novices start with experimentally changing parameters in *config.sys*, or attempting to install third-party drivers.

This procedure neglects OS/2's extended file attributes—when data is restored to the hard drive, the desktop can be corrupted with duplicate objects or missing file icons. And, when OS/2's system file or WPS Desktop become corrupted, then formerly well-behaved applications may also start crashing.

Back up now

The first thing any OS/2 user should do is to make backups of OS/2's key configuration files. The following components should be copied and stored: *config.sys* (located in the root directory of OS/2's boot drive), the internal system files *os2.ini* and

os2sys.ini (found in the *\os2* directory), and the OS/2 Desktop directory, *\desktop*. Copies can be stored on a safe hard-disk partition, floppy disk, or a tape drive. Pages 134-137 of the *Installation Guide for OS/2 2.1* and pages 431-436 of *Using the Operating System* outline some basic backup procedures.

In its documentation, IBM suggests you put a couple of statements into your *config.sys* that back up two generations of your *.ini* files each time you boot OS/2. This procedure is fine, as far as it goes, but frustrated users will typically try to launch OS/2 again from a damaged partition. After two successive attempts, the "good" *.ini* files will have been overwritten and lost forever. If you want to place backup statements in *config.sys*, you should copy more than two iterations.

The *backup.exe* procedure outlined on p. 433 of *Using the Operating System* copies the contents of the *\desktop* directory to a floppy disk. Although *backup.exe* won't copy files to another directory on the OS/2 boot

drive, you can use it to back up the Desktop to another partition on your hard drive. (If you have copies of the OS/2 ZIP and UNZIP utilities, you can also make quick backups of the Desktop by ZIPping it into an archive file in any chosen file path. Unlike DOS's *pkzip.exe* utility, the freeware OS/2 ZIP and UNZIP programs track and save extended attribute information. You can easily UNZIP the desktop archive back to your boot drive, preserving its contents.

Boot disks and maintenance partitions

If you're installing OS/2 for the first time on a new machine, consider allocating some hard-disk space for a small, secondary maintenance partition. Booting OS/2 from IBM's installation floppy disks is a slow two-disk process, but it is sometimes necessary for hard-disk maintenance or for adding device drivers. If you boot an OS/2 command prompt from a separate hard-disk partition, you can make modifications and repairs much more quickly than by using the installation disks.

The simplest way to establish a maintenance partition is to run a utility called Boot2X, which is an internally written IBM program that can be downloaded from CompuServe or the IBM OS/2 bulletin board. Reserve a 2MB to 4MB FAT partition on your drive with FDISK, then run Boot2X from a regular OS/2 command prompt. Boot2X copies the appropriate *.dlls* and system files to that small disk partition or to a single-floppy boot disk.

The payoff: From your maintenance command prompt, you can repair your main OS/2 partition with CHKDSK, edit *config.sys*, or update OS/2 drivers and *.dlls*. (The list of files necessary to set up a maintenance partition can be found in the documentation distributed with the OS/2 2.11 service pack, but using Boot2X is far less cumbersome.)

Another utility, ShiftRun, allows you to pre-boot an OS/2 command-line session from your main OS/2 disk partition. With ShiftRun installed in *config.sys*, you can hold down the shift key before the Workplace Shell starts, which temporarily launches *cmd.exe*, the text-based OS/2 command prompt. You can run any text-based OS/2 application needed to edit *config.sys* or restore a corrupted *.ini* file. Typing Exit closes the command prompt and resumes launching the Workplace Shell.

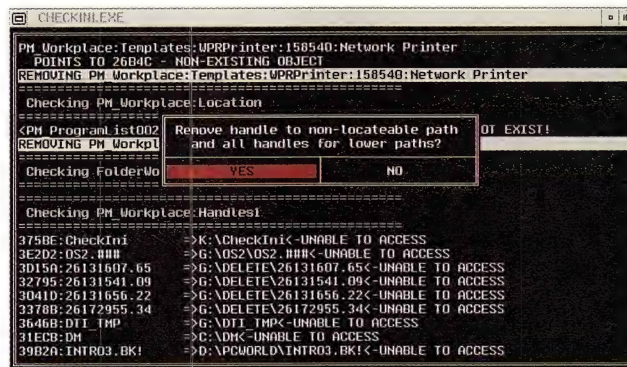


Figure 1: CheckIni analyzes the contents of the *os2.ini* and *os2sys.ini* files, requesting user input before it purges unwanted information.

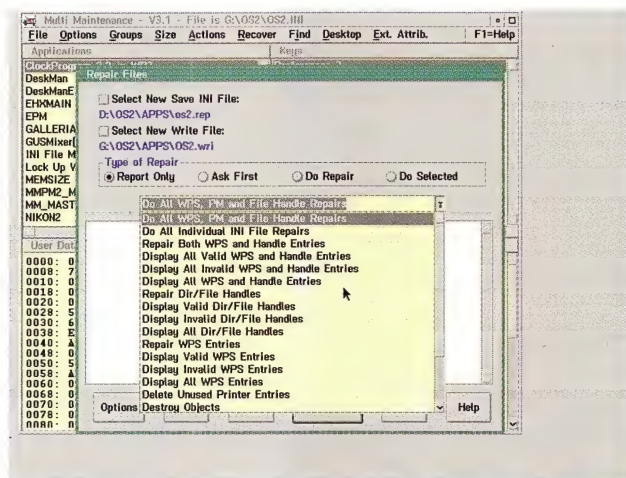


Figure 2: IniMaint/SysMaint/MultiMaint (all versions of the same program), can analyze and repair your OS/2 *.ini* files, allowing you to save a report and choose from a number of options.

Protecting the WPS desktop

The icons, file associations, and cosmetic appearance of the Workplace Shell Desktop are stored in three locations: the files *os2.ini* and *os2sys.ini*, and the *\desktop* directory tree on the OS/2 boot drive. If you can't start the Workplace Shell or if you notice missing icons and folders, copying the backed up *.ini* files and Desktop to your boot drive will usually cure the problem. (See the *Installation Guide*, p. 136) You must boot from an OS/2 floppy disk or maintenance partition, or use a tool like ShiftRun to reach an OS/2 command prompt.

Once you're at a command prompt, the backed-up *.ini* files must be copied to the *\os2* directory. If you then run OS/2's MAKEINI utility on the replacements, the default "out-of-box" color scheme, fonts, and system password will be restored. The desktop

will retain added objects and folders.

Final resort

The *Installation Guide* tells you that you can wipe out all custom Workplace Shell settings and completely return OS/2 to the out-of-the-box defaults by holding down <Alt-F1> while OS/2 is booting. Don't do it! If you back up your current *.ini* files regularly, this procedure shouldn't be necessary. Even if you have no backups of your current files, third-party tools are available

to clean up a damaged desktop; we'll discuss them shortly.

In general, your backups of *os2.ini* and *os2sys.ini* should be coordinated with \desktop backups. If you restore either of the .ini files or the \desktop tree alone, you may experience synchronization problems. A suggestion: before and after you install a new OS/2 application or utility, back up the .ini files and the Desktop as part of the process. You might want to set up a desktop object that runs a REXX script or .cmd file to accomplish this. Keep a generous number of backup generations, renumbering the old files as new ones are added.

Third-party Desktop utilities

If you'd like to simplify the task of protecting the OS/2 Workplace Shell, a number of third-party utilities can make life easier for you. You can simply perform regular backups to a tape drive, but restoring a damaged system from tape takes additional time and effort. Preserving emergency rescue information on a hard disk or floppy is more convenient. (We'll be looking at a series of OS/2 tape-backup systems in a subsequent issue—Ed.)

WP TOOLS

WP Tools is a freeware collection of command-line utilities. The WP Tools programs automatically back up and restore Desktop information and extend user control over the .ini files. CopyIni backs up the .ini files on-the-fly to any designated directory. CheckIni examines *os2.ini* and *os2sys.ini* for incorrect and redundant information. It can generate a text report of its findings and remove unwanted information from system files on a case-by-case basis.

You may know the trick of deleting an unshreddable object from the Desktop by moving it to a floppy disk or a RAM disk. However, when you do, ghost pointers to the file usually persist in *os2.ini*. If you

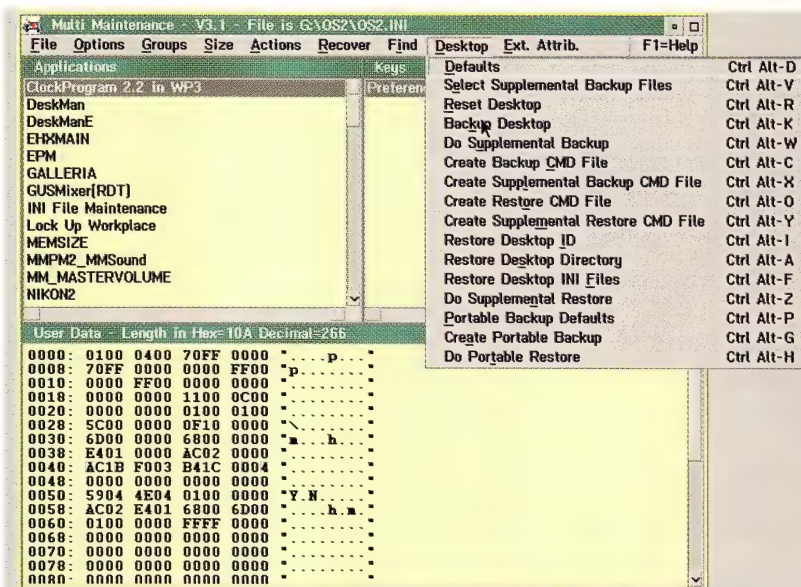


Figure 3: When IniMaint is upgraded to SysMaint or MultiMaint, a "Desktop" full of various backup and restore options is added to the program.

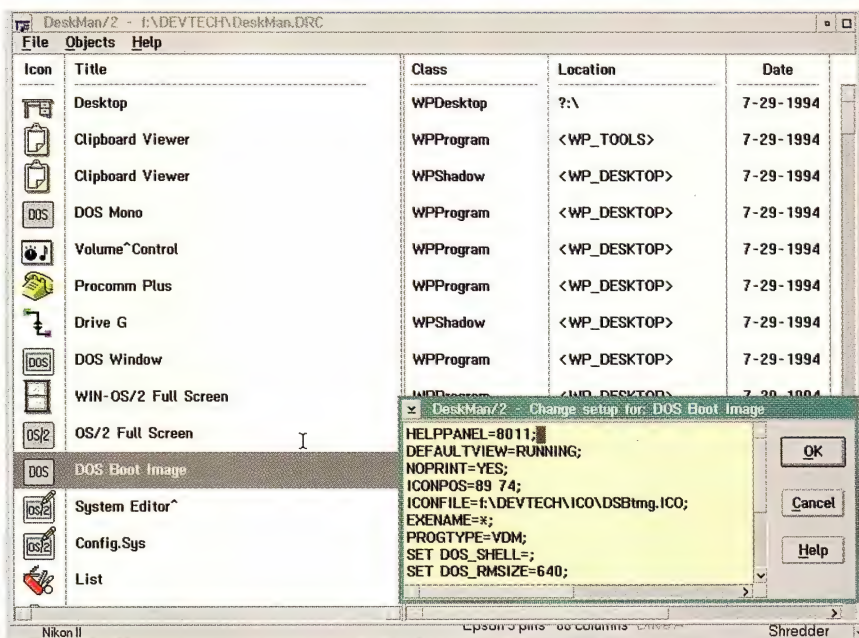


Figure 4: DeskMan/2's portable backup feature allows you to restore individual objects to the desktop and modify an object's saved Workplace Shell settings.

habitually create and delete work folders, *os2.ini* may become bloated with extraneous information. Running CheckIni can clear up this problem.

Repairs should be effected cautiously, since you can inadvertent-

ly delete information and make desktop objects disappear. The author of WP Tools warns that when CheckIni finds too many system errors, it's not advisable to do a mass purge. Instead, you should restore your Desktop from a previ-

ous backup. But when once-trustworthy applications behave errati-

cally or the Desktop displays redundant objects, running CheckIni can

be beneficial.

ReplIni is a utility that allows you to do a "live" substitution of backed up .ini files for the currently active files in the \os2 directory. This feature is useful mainly to software developers. Ordinary users will generally be on firmer ground if they boot up a maintenance command prompt, restore the Desktop from a good backup, and then immediately reboot the system.

WP Tools also contains two utilities that allow you to partially back up and restore the Desktop on a single-user system or to another machine. WpsBkp reads the contents of the Desktop directory and stores the information in a text file. WpsRest reads the text file and recreates the desktop. This restore will recreate all folders, program and shadow objects, and the icons assigned to them. It may not include certain abstract informa-

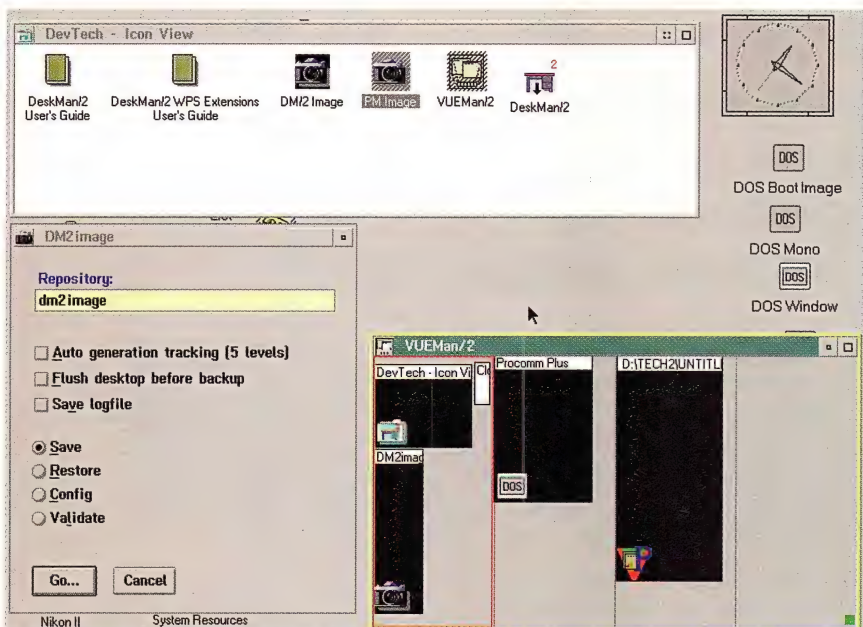


Figure 5: VueMan/2, a part of DeskMan/2, extends the OS/2 desktop, allowing you to view and switch between a series of open application windows on the enlarged "virtual desktop."

Table 1: Desktop tool features.

	WP Tools	IniMaint	SysMaint	MultiMaint	DeskMan/2
Backs up/restores Desktop automatically (single-user platform)	■		■	■	■
Backs up/restores .ini files automatically (single-user platform)	■		■	■	■
Edits .ini files in hex or text modes		■	■	■	
Repairs .ini files	■	■	■	■	
Makes separate backup of Extended Attributes			■	■	
Allows portable backup/transfer of OS/2 desktop	■			■	■
Allows portable backup of individual Desktop objects					■
Allows portable restore of individual Desktop objects				■	■
Allows on-the-fly restart of Workplace Shell without rebooting system	■	■	■	■	■
Restores internal program settings and palette information in Portable Desktop Transfer				■	
Allows viewing/editing of WPS object attributes					■
Includes REXX scripts or internal script language					■

If you've got the time

and inclination to fiddle with batch files or REXX on a single-user platform, the least expensive solution for desktop maintenance is to use OS/2's native tools or the freeware WP Tools package.

tion, such as color and font schemes or pointers to hidden abstract objects. The author recommends you use WP Tools only with the regular releases of OS/2 2.0 and 2.1—not betas or Service Paks.

INIMAIN

The IniMaint family of products, which contains three utilities—the shareware IniMaint, and the commercial SysMaint and MultiMaint—is a powerful group of system tools. It includes all of the features of WP Tools and more in a graphical, Presentation Manager interface. IniMaint, the basic shareware module, displays, edits, diagnoses, and repairs OS/2's *.ini* files. IniMaint is more sophisticated than CheckIni. In addition to examining the *.ini* files and effecting diagnostic repairs, it lets you inspect and edit *.ini* and Extended Attribute files on a byte-by-byte basis.

If you've ever been curious about the registration and configuration of Workplace Shell attributes and individual OS/2 applications, IniMaint tells all. You can use it to view and edit settings, preferences, window positions, and other user data for each individual desktop object. Objects can be displayed in useful diagnostic groupings, allowing you to modify, add, or remove single applications or application groups from the Workplace Shell.

Two upgrade registration levels for IniMaint are available. A registration serial number turns the

package into SysMaint or MultiMaint without the need to download or install additional files.

A SysMaint registration adds Extended Attributes and Desktop menus to the package. SysMaint users can back up successive generations of OS/2's Extended Attributes, *.ini* files, and the *\desktop* directory simply by pointing and clicking with the mouse. Another mouse click quickly restores a set of *.ini* files, the EAs for a FAT or HPFS partition, and an accompanying Desktop. SysMaint safely shuts down and restarts the Workplace Shell when you switch Desktops. You can use SysMaint to jump

backwards in time to restore last month's Desktop, or last year's. Then, you can bring back today's Desktop without even rebooting the system. SysMaint (and also Development Technology's DeskMan/2) actually transform this system rescue trick into a productivity feature!

IniMaint's IniClean module, which can be run from an OS/2 command line, completely erases the contents of any directory-subdirectory chain. This feature is useful for repairing the situation where, for some reason, the Workplace Shell appears to be using two independent Desktops.

An upgrade registration of IniMaint or SysMaint to MultiMaint adds a series of Portable Desktop backup options to the menu. SysMaint can't copy your desktop setup to other machines across a network. The backups it performs can only be restored to the original source machine. MultiMaint's portable desktop options allow custom Workplace Shell settings to be transferred to any machine running any version of OS/2. The Restore dialog permits transfer of

Removing Extra Desktops with IniMaint

Where do those extra Desktops come from? The most common cause is an improper application of the **MAKEINI OS2.INI INI.RC** procedure described in the *OS/2 Installation Guide*. Extra desktops can also appear when the user simply copies an old *.ini* file to the *\os2* directory at random, neglecting to restore the appropriate generation of the Desktop.

Here's the problem: When you click on the Drives Icon for the OS/2 boot drive, you may find two or more Desktops displayed.

Here's the cure: First, determine which Desktop displayed in the Drive display is active. The active Desktop will usually show a darkened, cross-hatched icon. Avoid clicking on and displaying the contents of the spurious desktops, since doing so can confuse the Workplace Shell into storing system information in them.

Once you've determined which Desktop directories are superfluous, perform the Backup Desktop command from SysMaint. Then immediately reboot the system to a maintenance command prompt (using floppies, a maintenance partition, or ShiftRun). At the command prompt run **INICLEAN [d:][Desktopxx]** where **Desktopxx** is the name of the spurious desktop directory. This command will completely remove the spurious desktop directory from the disk.

Next, run *sysrestr.cmd* from the command line to restore your recent *.ini* and *\desktop* backup. When you restart the Workplace Shell, your spurious desktops will be gone with no loss of configuration information.

an entire Desktop or individually selected Desktop Objects.

DESKMAN/2

Development Technology's DeskMan/2 is a slick, professionally produced, multipurpose set of Workplace Shell enhancements worthy of an article in itself. In this article, we'll examine only its backup and restore features.

DeskMan/2 is the easiest of the recovery utilities for a novice to work with. Since the Development Technology folks believe that tinkering with the internal contents of OS/2's *.ini* files is risky business, their Image Backup feature offers no *.ini* editing or repair options.

DeskMan/2 includes both command prompt and Workplace Shell programs. Both modules allow you to quickly back up, restore, or check the integrity of your Desktop and Workplace Shell configuration. As with SysMaint and MultiMaint, you can back up as many generations as you want of the *.ini* files and \desktop tree.

DeskMan/2's portable backup feature is extremely well implemented and easy to use. You don't have to record the entire Desktop for a portable transfer. Instead, you can simply drag and drop a series of individual objects into the DeskMan/2 window.

This feature is well-suited to cloning a custom Workplace Shell configuration on a number of user workstations. DeskMan/2 makes it easy to inspect every object created by the Workplace Shell. You can display or modify individual object settings, and copy all or part of the Desktop, intact, across a network. A series of REXX scripts are provided with the package to allow quick, unattended standardization of the Workplace Shell on a series of workstations.

The portable restore feature is also useful on a single-user workstation. For example, you might want to restore the settings and

objects for just one application or project folder without overwriting the remainder of the desktop. With respect to portable desktop backups, DeskMan/2 has an edge over MultiMaint in flexibility and in high-level, user-oriented features. DeskMan/2 lets you easily view or edit the Workplace Shell settings for any saved object, remap the pointers to a specific logical drive, and sort programs and folders by title, date, or object class.

More than the other packages, DeskMan/2 is designed as a productivity tool for end-users. The package includes numerous Workplace Shell enhancements beyond the scope of this review's coverage. (Just one worthy of mention is the VueMan/2 virtual desktop, which allows you to display multiple application and folder windows logistically in an expanded display area.)

MultiMaint's interface tends to be oriented toward programmers and technicians. For example, MultiMaint provides some low-level save and restore options in its current version that are not found in DeskMan/2. Set to record unpublished instance information for WPS objects, MultiMaint preserves a few additional application attributes (Scheme Palettes and internal application settings not stored in the Desktop). However, the advanced options, when turned on, may cause problems in working on a corrupted Desktop and *.ini* combination. Novices are better off using MultiMaint's "safe backup/restore" mode.

DeskMan/2 and MultiMaint both do a fine job in saving single-machine Desktop backups. DeskMan/2 is currently the only package under discussion with automated scripting capability. MultiMaint tends to be faster at saving and restoring a desktop image, and its backups (archived with OS/2 ZIP and UNZIP) occupy less hard disk space.

Wrapping it up

If you've got the time and inclination to fiddle with batch files or REXX on a single-user platform, the least expensive solution for desktop maintenance is to use OS/2's native tools or the freeware WP Tools package.

For software developers, systems administrators, program developers and other users with a critical interest in the low-level features of OS/2 (such as examining, verifying, or maintaining *.ini* files or working with extended attributes), SysMaint or MultiMaint are the way to go.

For sheer convenience in performing either an image or a portable desktop backup and restore, DeskMan/2 is the clear winner.

Lenny Bailes is a writer, teacher, and consultant in the San Francisco Bay Area. He can be reached via CompuServe at 70713,562.

RESOURCES

Boot2X, and ShiftRun (free)

IBM Employee-Written Software
CompuServe OS2SUPPORT, IBM Files: *boot2x.exe*
also on the IBM OS/2 User BBS at (919) 517-0001.

DeskMan/2 1.5 (\$79.95)

Development Technologies Inc.
308 Springwood Ct., Forest Acres, SC 29206
(803) 790-9230
READER SERVICE NO. 167

IniMaint (\$29.95)

SysMaint (\$49.95)

MultiMaint (\$69.95, \$25 upgrade from SysMaint)

Cary Associates
990 Ironwood Ct., Marco Island, FL 33937
(813) 642-9126
IniMaint can be found on CompuServe OS2AVEN
Other Vendors: *inixex.zip*
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WPTools (free)

By Henk Kelder
CompuServe OS2USER, Application Questions:
wptool.zip
also on the IBM OS/2 User BBS.

**Late-Breaking
Developments in the
World of OS/2**

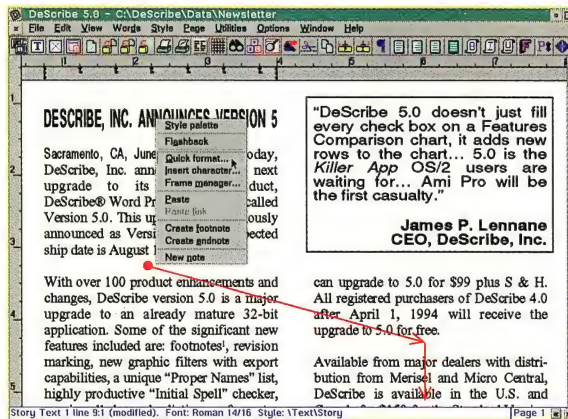
Just Announced

DeScribe 5.0

Fifth generation of venerable OS/2 word processor

DeScribe Inc. has announced the fifth incarnation of their OS/2 Word Processor, DeScribe. DeScribe 5.0 includes automatic footnotes, better frame handling, REXX support via macros, and pop-up context menus. It also includes an initial spell checker that checks words that are frequently misspelled and corrects them while the word is being typed. In addition, an equation editor will be available for \$29.95 shortly after the product ships. DeScribe 5.0 cx, the standard edition, sells for \$159, and DeScribe se, the subscription edition with expanded product support, is available for \$299. Upgrades for users of DeScribe 4.0 are \$99. Call DeScribe at (916) 646-1111 or fax (916) 923-3447.

READER SERVICE NO. 169



monitor or kill local and network processes. J&J Utilities sells for \$49.95. Upgrades are available for \$15. Call J&J at (405) 624-1472 or fax (405) 743-2613.

READER SERVICE NO. 171

Pmcomm 2.2

Workplace Shell terminal

Multi-Net Communications has announced the latest update to their 32-bit communications program, Pmcomm. This terminal program contains Workplace Shell-specific attributes, such as a drag-and-drop, file associations, and context-sensitive help. Other features include data-transfer rates of up to 921,600 bps, multiple dialing directories containing up to 300 entries each, and 10 internal-transfer protocols, including Z modem and CompuServe Quick B. This release includes a keyboard-remapping feature that allows macros to control window activity. Pmcomm is available for \$99.95, and includes free upgrades for one year. Call Multi-Net at (503) 883-8099 or fax (503) 883-7879.

READER SERVICE NO. 172

Desktop Observatory 3.1

Control those desktops from the desktop

Pinnacle Software announced a new update to their OS/2 desktop-management software, Desktop Observatory. This utility works as a desktop-management and security tool for LAN administration. User access to objects can be controlled and standard desktops can be set up with a user profile that can transport through various types of media. An expanded user guide with improved on-line help and event and profile logging is included in this release. The Extended Administration Facility, which aids in the creation of new desktops, is also included. Desktop Observatory sells for \$179. Upgrades from a previous version

are free from version 3.0 and up. Call Pinnacle at (800) 525-1650 or (317) 279-5157.

READER SERVICE NO. 170

J&J Utilities 1.5

Command line utilities go graphical

J&J Computer Consulting is releasing an updated version of their OS/2 utilities suite, the J&J Utilities. The major difference between this release and previous ones is that most of the utilities have been updated to include Workplace Shell interfaces. New utilities include the J&J Task bar, which aids in system navigation, and the J&J Task List, which can

PM Assistant 2.0

Macros for the Workplace Shell

Utilis Inc. announced the latest version of their OS/2 Utilities Package, PM Assistant. Version 2.0 provides hot-key application access, keyboard macros that can control Workplace Shell applications, task scheduling, a screen saver, and password protection. It also includes a window-placement utility and a

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task scheduler. PM Assistant sells for \$129. Call Utilis at (206) 467-4025.

READER SERVICE NO. 173

IPF Builder 1.12

View .inf files while you're building them

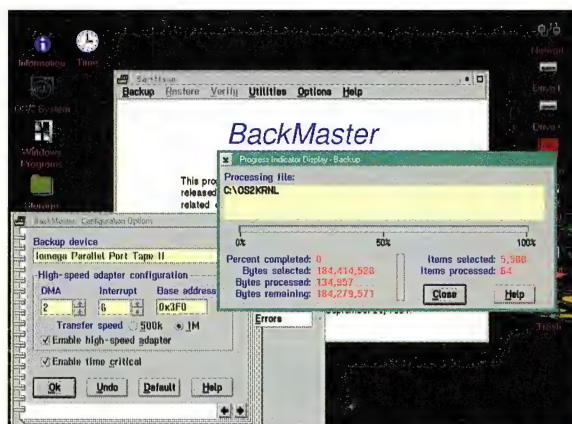
Custom Design Systems announced the release of IPF Builder, their utility for creating .inf files that can be viewed by OS/2's help facility. The main features include point-and-click access to IPF tags and utilities that help create headings and hypertext links. This multithreaded program is also capable of viewing

BackMaster 1.1

Parallel port QIC backup support for OS/2

MSR Development announced the latest release of the BackMaster OS/2 tape backup. This version supports QIC parallel-port tape-backup devices from Conner, Tecmar, Core, and Iomega. This release includes support for high-speed tape adapters, drag-and-drop startup routines, more command-line options, support for DOS/Windows backup programs using standard formats, and custom file-selection sets. BackMaster 1.1 sells for \$79.95. Call MSR at (409) 564-1862 or fax (409) 560-5868.

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the .inf files during the development cycle. IPF Builder is available at an introductory price of \$69 until November 1. It will then sell for \$99. Call IPF Builder at (604) 334-2263 or fax (604) 334-3125.

READER SERVICE NO. 175

CPU Monitor Plus 2.31

Pace your processor

BonAmi Software announced the latest release of their performance-testing utility, CPU Monitor Plus. This program graphically represents computer resources, such as CPU usage, amount of RAM available, disk activity, and COM access.

Features that are new to this release include priority management for DOS, Windows, and OS/2 programs and new monitoring for virtual memory, page faults, and swap files. This program will work with OS/2 version 1.2 or later, but many of the new features require OS/2 2.1 or later. CPU Monitor Plus sells for \$129.95. Call BonAmi at (508) 371-1997.

READER SERVICE NO. 176

SourceSafe 3.0

Multi-Platform Version Control

One Tree Software has added new features to their multi-platform

version-control system, SourceSafe. The latest version, 3.0, includes support for parallel project development, visual differencing of source-code versions, point-and-click report generation, and project-based source-code security. SourceSafe 3.0 works across multiple platforms under OS/2, DOS, Windows, Windows NT, UNIX, and Macintosh and is compatible with Novell NetWare local-area networks. SourceSafe 3.0 sells \$295 for a single-user license. Multi-user and multi-platform licenses are available as well. Contact One Tree Software at (919) 821-2300, fax (919) 821-5222, or CompuServe 72662,744.

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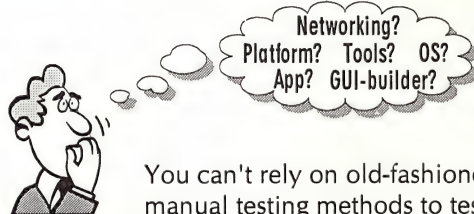
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Reader Service No. 26

Calling All Signals

IMPLEMENTING CONDITION TRAPS IN REXX BY DICK GORAN

In last month's column (October 1994, pp. 49-54), I touched on the subject of trapping the **NOVALUE** condition to detect and process uninitialized variables. To trap is to alter the program flow when a specified event occurs. Trap processing provides the program with the information it needs to identify the event.

Each trap is associated with the occurrence of an event. The specific event was raised as a result of a REXX instruction within the program or as a result of an external subroutine or command having notified the REXX program that an unusual condition occurred. Six events can be trapped, including, **ERROR**, **FAILURE**, **HALT**, **NOT-READY**, **NOVALUE**, and **SYNTAX**.

All condition traps are initialized as off in a REXX program, unless they are specifically set on with the **CALL** or **SIGNAL** keyword instructions. Information about the trapped event can then be interrogated with the **CONDITION()** built-in function. The definitions of the keyword instructions are shown in Listing 1 and the definition of the **CONDITION()** built-in function is shown in Listing 2.

When a condition trap is disabled (off) and the condition event occurs, the default action depends on the condition. The **NOVALUE** and **SYNTAX** conditions are raised by the code within the REXX program itself or by a return code set by an external subroutine or function. The other four trap condi-

tions are raised by external events. Unfortunately, IBM has offered no documentation that would indicate which external conditions raise the **ERROR** condition and which external conditions raise the **FAILURE** condition. I suggest that whenever you enable one, you enable both and service the trap event with common code.

For **HALT** and **SYNTAX**, the execution of the program is terminated and the system displays a message indicating that the event occurred. If you stopped a running program with <Ctrl+Break>, you would see the message shown in Fragment 1.

Fragment 1:

```
REX0004: Error 4 running program.CMD, line ?: Program
         interrupted.
```

Fragment 2:

```
REX0040: Error 40 running program.CMD, line ?: Incorrect call
         to routine.
```

A syntactical error can occur from calling a non-existent function and might produce the line shown in Fragment 2.

For all other events, the condition is ignored and the state of the condition remains off.

When a condition trap is currently enabled (on) and an event that raises the condition occurs, the program flow is altered as if a **CALL trap_processing_routine** or **SIGNAL trap_processing_routine** had

been issued. The name associated with **trap_processing_routine** may be specified with the label following the **NAME** sub-keyword shown for both the **CALL** and **SIGNAL** instructions in Listing 1. If the **NAME** option is not used, the **trap_processing_routine** name is the same as the condition name. For example, the routine name for processing a **SYNTAX** event trap is **SYNTAX** and the routine name for processing a **NOVALUE** event trap is **NOVALUE**. Fragment 3 contains an example of setting up a routine to process **NOVALUE** traps with the default name. Fragment 4 contains an

example of setting up a named routine for processing **NOVALUE** traps.

The **CALL ON** and **SIGNAL ON** instructions enable (set on) the event-trapping facility. Take note, however, the **CALL ON** instruction can not be used with the **SYNTAX** or **NOVALUE** condition.

The sequence of events that follow a trapped event are dependent on whether a **CALL** or a **SIGNAL** is to be made to the trap processing routine.

Definition 1: CALL and SIGNAL instructions.

CALL {ON | OFF} condition [NAME label]

Activates or deactivates the user defined condition related handlers. Control transfers to the label matching condition by a CALL instruction if the condition occurs while the trap is ON. Label may specify an alternative label name.

Condition can be 'ERROR', 'FAILURE', 'HALT', 'NOTREADY'.

SIGNAL {ON | OFF} condition [NAME label]

Activates or deactivates the condition handler. Control transfers to the label matching condition by a SIGNAL instruction if the condition occurs while trap is ON.

Label may specify an alternative label name. Condition can be 'ERROR', 'FAILURE', 'HALT', 'NOTREADY', 'NOVALUE', or 'SYNTAX'.

When control reaches the specified label, the line number of the SIGNAL instruction is assigned to the special variable SIGL. This can aid debugging because SIGNAL can determine the source of a jump to a label.

Definition 2: Condition () function.

CONDITION() function **CONDITION([option])**

Returns a word from the list shown (option C, I, or S, or a descriptive string (option D) associated with the current trapped condition indicated by option. Option can be C (condition), D (description), I (instruction), or S (status). Possible combinations of values (one from each column) returned for all options but D are:

May return:	If:	c	i	s
CALL			■	
DELAY				■
ERROR		■		
FAILURE		■		
HALT		■		
NOVALUE		■		
NOTREADY		■		
OFF				■
ON				■
SIGNAL			■	
SYNTAX		■		

In the instance of this function being issued following a NOVALUE trap for condition D, the value is the uninitialized variable.

If SIGNAL was used to enable the trap processing, execution of the instruction that raised the trap condition is halted, the condition is disabled (set to off), and control is passed to the routine designated for processing that particular trap condition. Because the condition is disabled, a new CALL ON or SIGNAL ON instruction would be necessary to re-enable the

Fragment 3: CALL and SIGNAL default name examples.

```
call on HALT
signal on NOVALUE
MAIN_LINE:
...
exit

HALT:
say 'Ctrl-Break is being ignored'
return

NOVALUE:
/* process NOVALUE trap */
exit
```

Fragment 4: CALL and SIGNAL with named routines.

```
call on HALT name HALT_ROUTINE
signal on NOVALUE name NOVALUE_ROUTINE
MAIN_LINE:
...
exit

HALT_ROUTINE:
say 'Ctrl-Break is being ignored'
return

NOVALUE_ROUTINE:
/* process NOVALUE trap */
exit
```

condition within the first trap processing routine. Because the condition has been disabled, it first prevents a non-interruptable loop from occurring unintentionally.

If CALL was used to enable the trap processing, the trap processing routine is given control as if the CALL instruction existed immediately following the clause that raised the condition. The only difference is that the special variable RESULT is not affected by execution of the CALL. Similarly, any expression specified in the RETURN instruction, at the end of the trap processing routine, is ignored. The value of RESULT in the calling routine remains unaffected.

When the trap event occurs, the matching condition is marked as delayed (before the actual CALL takes place) and remains in that state until return from the called routine. When a return is made to the routine that caused the trapped event to occur, the condition state (on or off) is restored. Therefore, the trap processing routine can be used repeatedly.

The CONDITION() built-in function can be used to

interrogate the current trap event. **CONDITION()**, using one of its four options, will return a string that indicates the name of the condition (C), the name of the uninitialized variable that raised the **NOVALUE** event (D), the instruction used to transfer control to the trap event routine—**CALL** or **SIGNAL** (I), or the status of the condition (S). Definition 2 summarizes all of these options.

The **ERROR** condition is raised by an external command that returns an error code. An OS/2 **COPY** command issued from within a REXX program running from an OS/2 command line, that specifies a non-existent file name, serves as an example of an event that will raise the **ERROR** condition. Fragment 5 shows a working example of a REXX program that will raise the **ERROR** condition and display the status of the error on the console. The screen output

from the program is included at the end of the program as a comment.

If your program was trapping the **ERROR** condition, you would either redirect or suppress the error message (shown in the shaded lines). The error lines could be redirected to a REXX data queue, a file, or could be sent to the big bit bucket in the sky (ignored). Fragment 6 shows the respective changes necessary to the **COPY** command to effect the redirection or piping of the data sent to **STDERR** as a result of the erroneous **COPY** command.

To prevent the **COPY** command from echoing, precede it with an at sign (@) or redirect **STDOUT** (1>), similar to the example shown in Fragment 6 for **STDERR**.

Publication space limits my ability to include a full example of a trap processing routine here. However, the file *9411ls01.cmd* may be downloaded from

CompuServe in Library 8 of the OS2AVEN forum as *rxls01.cmd* and is also available on the Internet for FTP from *ftp.netcom.com:/pub/dgoran*.

One of the best uses for setting up trap routines is to identify uninitialized variables that result in a **NOVALUE** trap. Two external REXX Application Program Interfaces (APIs) that are available, **REXXLIB** (from Quercus Systems) and **SuperSet/2** (from GammaTech), provide the facility to write all or some of the contents of the REXX variable pool (the variables you create in your program) to a file. When one of these APIs is used in conjunction with the trap processing routine shown in *9411ls01.cmd*, a file with the same name as the REXX program and a file extension of *.dmp* is created that contains the name and the contents of all of the initialized variables along with other information related to the trap. The *.dmp* file

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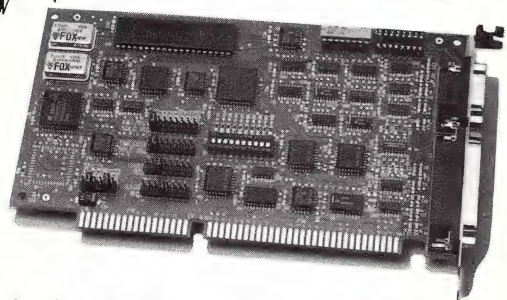
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Fragment 5: ERROR condition example

ERROR condition example/* 9411FG05.CMD - Raise ERROR condition */

```
call on ERROR
'copy a_b_c_d nul'

say ''
say 'Main routine RC = ' ||,
    rc
exit
```

```
ERROR:
say ''
say 'ERROR routine entered'
say '  Condition(C) = ' ||,
    CONDITION( 'C' )
say '  Condition(I) = ' ||,
    CONDITION( 'I' )
say '  Condition(S) = ' ||,
    CONDITION( 'S' )
return
```

/*
Results from 9411FG05.CMD

copy a_b_c_d nul

SYS0002: The system cannot find the file specified.
0 file(s) copied.

a_b_c_d

```
ERROR routine entered
  Condition(C) = ERROR
  Condition(I) = CALL
  Condition(S) = DELAY
```

Main routine RC = 1
*/

Fragment 6: COPY command to effect redirection

```
/* a */ 'copy a_b_c_d nul 2>&1 | RXQUEUE'
/* b */ 'copy a_b_c_d nul 2>COPY.OUT'
/* c */ 'copy a_b_c_d nul 2>nul'
```

is created in the same directory where the program resides. In the event that the program is running from the REXX macrospace, the *.dmp* file is created in a directory pointed to by the **TEMP** environment variable. If the **TEMP** environment variable does not exist, the *.dmp* file will be created in the current directory of the current drive.

Program debugging is much simpler when this information is available after your program traps. Figure 1 shows the screen output from the trap processing routine found in *9411ls01.cmd*.

9411ls01.cmd contains a **CALL** to the **REXXLIB** function **VAR-DUMP()** at line 107. However, this could be replaced with a call

to any routine capable of dumping the REXX variable pool to a file. It is presumed that the DLL containing the variable pool dump facility has already been registered with the **RxFuncAdd()** built-in function.

This same technique can be very useful with a program that is looping. By making a comment of the assignment statement at line 53, the dump file will be created when the program is halted with <Ctrl-C>. The **DROP** instruction at line 106 precludes the variables used to setup the screen output, which are extraneous to your program, from showing in the dump file.

Creation of a *.dmp* file (which I described earlier) is also extremely handy when using a series of REXX programs and external functions that are interrelated. In the event of a failure in any of the REXX programs, *.dmp* files will document where the errors occurred. You may choose a different file extension for these variable dump files, however, I have not found any conflicts using the *.dmp* extension with any other programs.

RESOURCES:

OS/2 2.0 Procedures Language/2 REXX Reference Guide (\$15.00)

IBM Corp.
P.O. 9046
6300 Diagonal Hwy.
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Figure 1: Screen Output from the Trap Processing Routine.

```
/* 9411FG01.TXT - 9411LS01.CMD Screen output */
```

```
copy a_b_c_d nul
a_b_c_d
SYS0002: The system cannot find the file specified.
        0 file(s) copied.
```

```
9411LS01.CMD
Error Line = 12; ERROR error. Return code = 1
```

```
See: C:\OS2-MAG\9411LS01.DMP
```

Source line at time of trap:

```
'copy a_b_c_d nul'
```

```
/* 0012 */
```

Dick Goran is the author of the REXX Reference Summary Handbook, an OS/2 reference. He has been in the computer industry since 1961 and was in the IBM main-frame systems software development business until 1987. He can be reached at 71154,2002 on CompuServe, 71154.2002@compuserve.com on Internet, HONE81 (DEV4672) on IBMLink, and receives Fido Netmail at 1:209/705. He invites your questions and comments via Email.

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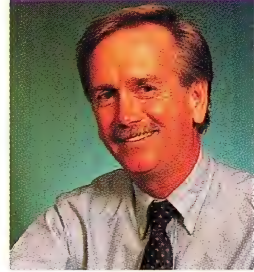
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Faster Chips Were Made for OS/2

SHOPPING FOR AN OS/2 SYSTEM: PICKING A PROCESSOR BY DICK CONKLIN



Shopping for your next OS/2 system? I'll bet that performance is likely to be a major factor in the choice you make. In a GUI-based, multitasking environment, you'll want to open folders and jump between applications instantaneously. The amount of system memory and the speed of the hard disk are important, but the processor is still the heart of the machine. In this month's column, I'll look at OS/2 processors and offer some rules of thumb for comparing systems.

Your mileage may vary

Of course, your standards for the performance of your system depend on how you use it in your daily work. If you spend most of your time connected to a remote system, modem speed may be a lot more important than your processor. If you are evaluating hardware for your company, you should benchmark candidate systems running a typical mix of your OS/2 applications. If you don't have time for that, a processor comparison is a good start. Keep in mind that two computers with the same processor, running at the same speed, with the same amount of RAM may still give performance results that are up to 50 percent different. Other factors can influence a system's performance, such as cache memory (a buffer between the system RAM and the processor), the bus architecture, video RAM, and

the hard disk's access time and data-transfer rate.

Intel processors—the series continues

Today, OS/2 systems use an Intel processor or a compatible clone (such as the IBM SLC2-50 in my ThinkPad 500). An 80386 is a minimum requirement, because OS/2 versions 2.0 and 2.1 were written to take advantage of its 32-bit internal processing capability. The original 8088-based IBM PC, its successor, the 80286-based PC AT, and even some of the early IBM PS/2s are 16-bit machines and won't run OS/2 2.x. Table 1 lists current members of the Intel processor family, from 80386 to the new Pentium processors. Three basic families of 32-bit processors exist, from the 80386 and 486, to the Pentium processors.

The 386DXs were the first 32-bit Intel chips. 386DXs move data to and from memory on a 32-bit-wide (the D stands for double word) data bus. 386SXs with a 16-bit bus (S for single word) are slower, even when running at the same clock speed.

The next-generation 486DX introduced 8K of on-chip cache memory and other improvements. The later 486SX was released—a less expensive version of the 486DX without a math coprocessor. (Yes, the letter "SX" and "DX" are used differently in the 486 family than in the earlier 80386 processors.) Both the 486SX and the 486DX are 32-bit double-word processors, but the 486SX doesn't have the math coprocessor that the 486DX has. In addition, both flavors of 486 have a cache memory controller that retains frequently used instructions

Table 1: The OS/2-compatible 80386 Family of Processors.

Processor	Speed	Data Bus	Address Bus
Intel i386SX-16	16MHz	16-bit	24-bit
Intel i386SX-20	20MHz	16-bit	24-bit
Intel i386SX-25	25MHz	16-bit	24-bit
AMD Am386SX-33	33MHz	16-bit	24-bit
Intel i386DX-25	25MHz	32-bit	32-bit*
Intel i386DX-33	33MHz	32-bit	32-bit
AMD Am386DX-33	33MHz	32-bit	32-bit
AMD Am386DX-40	40MHz	32-bit	32-bit

Table 2: The OS/2-compatible 486 Family of Processors

Processor	CPU Speed	Bus Speed	Data Bus/ Address Bus	Internal Cache	Math	3.3Volt
Intel i486SX-16	16MHz	16MHz	32-bit/32-bit	8K		
Intel i486SX-20	20MHz	20MHz	32-bit/32-bit	8K		
Intel i486SX-25	25MHz	25MHz	32-bit/32-bit	8K		SL enhanced
Intel i486DX-25	25MHz	25MHz	32-bit/32-bit	8K	■	
Cyrix 486DX-33	33MHz	33MHz	32-bit/32-bit	8K write-back	■	
Intel i486SX-33	33MHz	33MHz	32-bit/32-bit	8K		SL enhanced
Intel i486DX-33	33MHz	33MHz	32-bit/32-bit	8K	■	SL enhanced
Cyrix 486DX-40	40MHz	40MHz	32-bit/32-bit	8K write-back	■	
Intel i486 DX2-40	40MHz	20MHz	32-bit/32-bit	8K	■	■
AMD Am486SX2-50	50MHz	25MHz	32-bit/32-bit	8K		
AMD Am486DX2-50	50MHz	25MHz	32-bit/32-bit	8K	■	
Cyrix 486DX-50	50MHz	50MHz	32-bit/32-bit	8K write-back	■	
Cyrix 486DX2-50	50MHz	25MHz	32-bit/32-bit	8K write-back	■	
IBM 486SLC2-25/50	50MHz	25MHz	16-bit/24-bit	16K		■
IBM 486SX2-25/50	50MHz	25MHz	32-bit/32-bit	16K		■
IBM 486DX2-25/50	50MHz	25MHz	32-bit/32-bit	8K write-back	■	
Intel i486DX-50	50MHz	50MHz	32-bit/32-bit	8K		
Intel i486DX2-50	50MHz	25MHz	32-bit/32-bit	8K	■	SL enhanced
AMD Am486SX2-66	66MHz	33MHz	32-bit/32-bit	8K		
AMD Am486DX2-66	66MHz	33MHz	32-bit/32-bit	8K	■	
Cyrix 486DX2-66	66MHz	33MHz	32-bit/32-bit	8K write-back	■	
IBM 486SLC2-33/66	66MHz	33MHz	16-bit/24-bit	16K		■
IBM 486SX2-33/66	66MHz	33MHz	32-bit/32-bit	16K		■
IBM 486DX2-33/66	66MHz	33MHz	32-bit/32-bit	8K write-back	■	
Intel i486DX2-66	66MHz	33MHz	32-bit/32-bit	8K	■	
IBM 486SX3-25/75	75MHz	25MHz	32-bit/32-bit	16K		■
Intel i486DX4-75	75MHz	25MHz	32-bit/32-bit	16K	■	
AMD Am486DX2-80	80MHz	40MHz	32-bit/32-bit	8K	■	
IBM 486DX2-40/80	80MHz	40MHz	32-bit/32-bit	8K write-back	■	
IBM 486SX3-33/100	100MHz	33MHz	32-bit/32-bit	16K		■
Intel i486DX4-100	100MHz	33MHz	32-bit/32-bit	16K		

Table 3: The OS/2-compatible Pentium Family of Processors

Processor	CPU Speed	Bus Speed	Data Bus/ Address Bus	Internal Cache	Math	3.3Volt
Intel Pentium-60	60MHz	60Mhz	64-bit/32-bit	dual 8k write-back	■	
Intel Pentium-66	66MHz	66Mhz	64-bit/32-bit	dual 8k write-back	■	
Intel Pentium-90	90MHz	60Mhz	64-bit/32-bit	dual 8k write-back	■	■
Intel Pentium-100	100MHz	66Mhz	64-bit/32-bit	dual 8k write-back	■	■

For more information, call Intel at (800) 395-7009, Cyrix at (214) 994-8388, IBM at (800) 426-0181 or IBM's Fax-Back service at (415) 855-4121, or AMD at (800) 222-9323.

and anticipates future instructions before they are needed. By keeping these instructions in cache memory, fewer calls to the slower system memory are needed.

The 486SX2 and 486DX2 chips double the processor's internal speed while maintaining the same external clock speed as their 486SX and 486DX counterparts. The 486DX4 is a speed-tripling version (no, it doesn't quadruple the speed as its name might suggest). The latest-generation Pentiums incorporate several performance enhancements, such as a 64-bit-wide data bus.

Clones abound

But Intel isn't the only player. Compatible processors are made by several companies, including IBM, Cyrix, and American Micro Devices (AMD). All are instruction-set compatible, enabling them to run the same software. Clock speeds and most features are the same or similar to their Intel counterparts, as are their names (most processor names state the clock speed and processor type). Some companies add features of their own, such as Cyrix's 486DX and 486DX2 chips, which boast a write-back cache for better performance.

Quick fixes

Table 1 lists other chip characteristics that affect performance. A math coprocessor (built-in or added as a plug-in option) can help, but only if your applications are programmed to take advantage of it. OS/2 itself does not exploit a math coprocessor but some computer-aided design as well as other compute-intensive applications do.

Dick Conklin is editor-in-chief of OS/2 Developer, contributing editor to OS/2 Magazine and author of three OS/2 books. He can be reached at CompuServe 76711,1005 or Internet os2mag@vnet.ibm.com.

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Understanding DOS Settings

GET THE MOST OUT OF YOUR DOS PROGRAMS BY USING OS/2 BY MARK MINASI

Many of the DOS Settings mirror commands you'd find in a DOS *config.sys* file. You may already have read (if you've caught the past column or two) about the beauty of running DOS programs under OS/2. OS/2 allows you to build a kind of "imaginary PC" for your DOS program. You probably do something like it right now under DOS if you have more than one *config.sys* file or if you use the MultiConfig feature of DOS 6.x. If you do, you've got one *config.sys* that you use when you're using the network, another that you use when you're running Wing Commander, and perhaps another that you use when you need enough memory to support some other DOS program. No matter how clever your DOS setup is, you can't get around the annoyance of having to reboot your system every time you want to employ a slightly different arrangement.

You can't get around it unless you're using OS/2. Thousands of OS/2 users only use OS/2 as a way to make their PC not only run multiple DOS programs (after all, Windows can do that) but run multiple versions of DOS.

Take note of the **dos_autoexec** setting. It lets you build a custom *autoexec.bat* file for each DOS program you run. Most of the time, the basic *autoexec.bat* in the root directory is quite sufficient, but if you need a special PATH or a driver, such as a terminate-and-stay-resident

**Thousands of
OS/2 users only use
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program (TSR), all you need to do is create the *autoexec.bat* that's right for your application and point your DOS session to that batch file. You don't even need to call it *autoexec.bat*. In fact, it might be best to avoid calling it that, as you could confuse the system or yourself. If you save your specialized *autoexec.bat* in your root directory, it will overwrite the default *autoexec.bat*. You can use a fully specified path name of any batch file—such as *c:\mystuff.bat*, but make sure it's a batch file and not a *.cmd* file. Unfortunately, you can't start off a DOS program with a REXX file.

The **dos_break**, **dos_fcbs**, **dos_fcbs_keep**, **dos_files**, **dos_lastdrive**, and **dos_shell** commands should look familiar because they directly correspond to the **break=**, **fcbs=**, **files=**, **lastdrive=**, and **shell=**

commands for any DOS *config.sys*. You can use commands under OS/2 the same way you would use them under DOS.

The **dos_device** statement corresponds to the DOS **device=** statement, but it's not a complete analog of the DOS command. As you probably know, the **device=** statement loads device drivers (programs that extend the capabilities of an operating system). Although the people who designed DOS, back in 1983, couldn't know that between 1983 and 1994 mice, local-area network (LAN) boards, SCSI host adapters, scanners, CD-ROMs, and so on, would become commonplace and that DOS would have to support them, they could guess that something might come along. It is the computer business, after all, and once something works, it must be obsolete. So, the DOS designers left a kind of "back door" in DOS whereby a programmer could write a program to build support for a new device into DOS—a device driver.

Device drivers come in two types—character devices and block devices. Character device drivers expect data character by character, for example, keyboards, printer ports, and communications ports. (Communication-port device drivers can be implemented as block devices, which I've seen, but the earliest communication-port drivers were character devices.) Block device drivers expect data in blocks. For example, some include disk dri-

ves, tape drives, LAN boards, and memory managers.

It's something of a minor miracle that the OS/2 designers were able to implement an OS/2 structure that could incorporate a DOS-based real-mode device driver into OS/2, but it's essential. Plenty of nifty peripherals come with device drivers for DOS, but as OS/2 fans know, we're often last on the pecking order when it comes to getting device drivers written. So, supporting some oddball device under OS/2 can't wait for someone to write the device driver. It's nice that OS/2 can use a DOS device driver, but OS/2 can only use character device drivers. Suppose you've got some printer device driver that is invoked from DOS with the line in Fragment 1.

You'd incorporate it into your OS/2 configuration by going to the DOS program that uses this device driver, opening up its DOS Settings window, and scrolling down to the **dos_device**. You'll see an edit field on the right-hand side of the window. Type the line as shown in Fragment 2.

Save the setting, fire up the program, and it should work like a charm.

Next, consider the **dos_high**, **dos_umb**, and **video_mode_restriction** settings. You'll use these settings to juggle memory management for a DOS session. **Dos_high** loads a big piece of the OS/2 DOS emulator outside the low 1,024K of apparent memory addresses, which frees up conventional memory for any program you're running.

The options for this command are **on** and **off**. I can't figure out why they even bother offering the **off** option. OS/2 2.0 turned it **off** by default, but the newer versions seem to default to **on**, which is a good thing. Opening up a simple DOS command session with **dos_high** set to **off** showed about 596K of free memory. Changing the setting to **on** increased that free memory to 622K. You don't have

Fragment 1: A Driver in *Config.sys*

```
DEVICE=C:\3RDPARTY\PDRIVER.SYS /D:LPT1 /T:0
```

Fragment 2: A Driver in *Dos_device*

```
C:\3RDPARTY\PDRIVER.SYS /D:LPT1 /T:0
```

to go to all of your DOS objects and set **dos_high** to **on**. All you have to do is add the line **dos=high** to your OS/2 *config.sys* file (if it isn't there already) and your DOS objects will default to putting DOS high, unless you override the setting.

It's worthwhile to take a minute to appreciate just how nice OS/2 is when compared with DOS/Windows. I have loaded support for my CD-ROM drive, my Ethernet board, TCP/IP software, my Sound Blaster, and super VGA drivers onto my OS/2 workstation. Without any effort at all, I can get 596K free. With a couple of mouse clicks, that number goes up to 622K, with no loss of functionality. But we can do an even neater trick.

The **video_mode_restriction** was one of the first exciting features I saw in a mid-1989 OS/2 2.x beta. It allows you to create an imaginary PC that only has a color graphics adapter (CGA)—a circa-1981 output device. Why would you do that? Because it allows OS/2 to fill up more conventional memory space. What price do you pay? Any programs run with CGA emulation can only run text and ugly low-resolution graphics.

In the DOS Settings for a DOS command window, click on **video_mode_restriction**. You'll see that the options are None, CGA, and Mono. Choose CGA and open up the command window. Type MEM and you will find that your DOS session will have 717K free.

If you're wondering if the video-mode restriction is a useless idea, think again—it's not. Many perfectly good DOS programs do not need graphics, or can run without

graphics. For example, WordPerfect 5.1, Lotus 2.2 without WYSIWYG, and dBase IV run just fine without graphics. WordPerfect and Lotus, however, can use graphics in some of their functions. You can even let them run in graphics mode as long as the graphics are CGA graphics (which are crude but sometimes sufficient).

Third in the memory-management team is the **dos_umb** setting. It corresponds, of course, to the **dos=umb** command of DOS 5 and 6 and it instructs OS/2 to load any DOS device drivers and memory-resident or TSR programs higher than the conventional memory range, freeing up still more conventional memory. Loading device drivers and TSRs out of conventional memory is the meat and drink of DOS memory-management wizards, but it's not that difficult under OS/2, because, again, we just don't need as many device drivers and TSRs under OS/2. My sessions, for example, usually contain only **append** and the *command.com* command interpreter. Setting **dos_umb** to **on** will, however, get **append** to load somewhere else, bringing the free memory for a normal session from 622K to 628K. If you add the video-mode restriction, the free memory goes up even more—to 724K.

Mark Minasi has been a consultant and educator in the fields of advanced PC operating platforms and PC technology since 1984. He is a contributing editor for Compute, BYTE, and OS/2 Magazine. You can contact him at CompuServe 71571,264 or Internet mminasi@access.digex.net.

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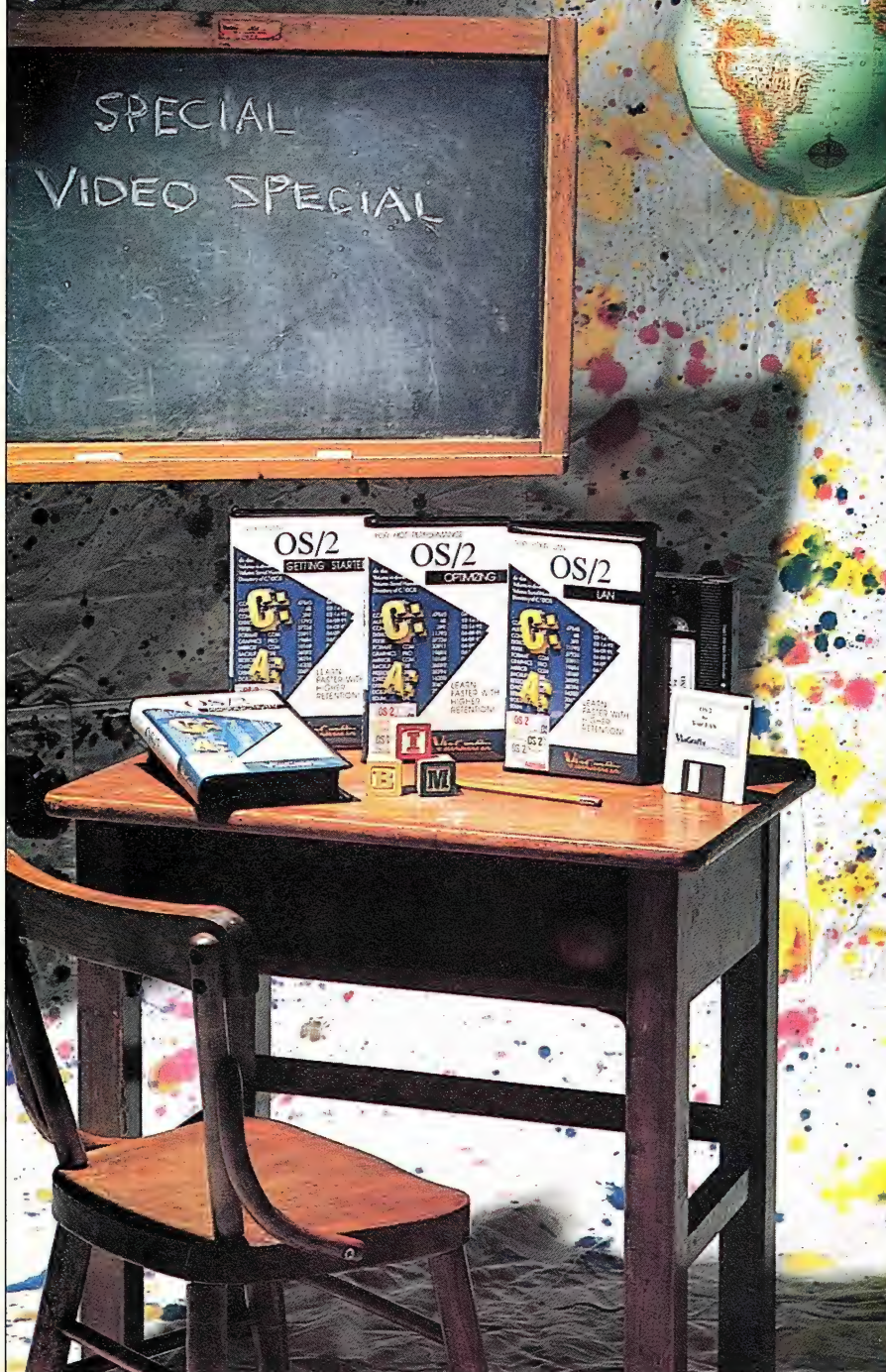
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Inner Workings of the Workplace Shell

OPENING FOLDERS FROM CONTEXT MENUS,
CALL AND RUN STATEMENTS, FONTS, AND MORE... BY DAVID REICH



OPENING FOLDERS

In the August issue (*OS/2 Magazine*, p. 78), I responded to a question about whether or not it was possible to add folders to the desktop menu. OS/2's user interface is only set up to launch programs from a context menu, but you can write a program that opens a specified folder. Many readers sent notes suggesting a variety of methods that will do just that—most of which use REXX. One suggestion, sent in by Carlos Rodriguez, presents what I feel is the most complete solution.

The main part of this solution is a REXX program, shown in Listing 1, that opens a specified folder. It uses the REXX interface to the Workplace Shell, which is included with every OS/2 package. In *openfldr.cmd*, shown in Listing 1, if the REXX utilities are not loaded (based on the result of the *RxFuncQuery* call), the utilities are loaded. The next part of the program opens the specified folder. The *<WP_TEMPS>* part of the function call indicates that the Templates folder should be opened. This part can be replaced with the object identifier for the folder you want. Place the identifier inside the angled brackets.

This particular solution is more flexible than the others that were submitted. The other REXX program, *getids.cmd*, shown in Listing 2, obtains all of the object identi-

fiers in your system, so you can specify the folder you want.

All Workplace Shell objects have object IDs. The object IDs are stored in the *os2.ini* file. *Getids.cmd* uses the REXX interface to this file to obtain all of the object IDs in the system. You can display them or redirect this

list to a file for future reference. Once you have the object IDs, you can replace the *<WP_TEMPS>* variable in the *openfldr.cmd* program to open the desired folder.

To add different folders to a context menu, you simply create several iterations of *openfldr.cmd*—each

Listing 1: *Openfldr.cmd*

```
/* OPENFLDR.CMD - Open Templates Folder */
/* Load REXXUTIL */
IF RxFuncQuery('SysLoadFuncs') THEN /* If not loaded */
DO
    call rxfuncadd sysloadfuncs, rexxutil, sysloadfuncs
    call sysloadfuncs /* Load the REXX functions */
END

'@echo off'
call SysSetObjectData '<WP_TEMPS>', 'OPEN=DEFAULT;'
/* Open the folder */

exit
```

Listing 2: *Getids.cmd*

```
/* GETIDS.CMD - Shows object ids from OS2.INI */
/* Load REXXUTIL */
IF RxFuncQuery('SysLoadFuncs') THEN /* If not loaded */
DO
    call rxfuncadd sysloadfuncs, rexxutil, sysloadfuncs
    call sysloadfuncs /* Load the REXX functions */
END

'@echo off'
call SysIni 'USER', 'PM_Workplace:Location', 'All:', 'id.'
do j=1 to id.0
    say id.j /* Get all the object IDs */
end

exit
```


with a unique name and each with a unique <WP_TEMPS> variable value. Adding each iteration to a context menu will give you the ability to open folders from context menus.

But another option exists as well. The newest version of OS/2 includes a new Launch Pad upon which you can place any Workplace object. This Launch Pad can be placed anywhere on your desktop. You can open any object on it with a single mouse click. The context menus have remained, so you can still use the programs in Listing 1 and Listing 2 to open folders from them. But, you have another method that doesn't require any programming and is built right into the Workplace Shell.

CALL AND RUN

Q: What is the difference between the call and run statements in *config.sys*?

A: Call and run are two statements that start programs while the system is booting up—even before the objects in the Startup folder are invoked or any programs in *startup.cmd* are started. Both statements start a program during the *config.sys* processing. The difference between them is how synchronous the program execution is with regard to *config.sys*.

A call statement in *config.sys* causes the specified program to be run during the *config.sys* processing, but *config.sys* will not continue until the program execution is complete. In contrast, specifying a program in the run statement in *config.sys* causes the program to be run asynchronously from the processing of *config.sys*. Essentially, run starts a new OS/2 process while call runs the specified program in the current (in this case, system initialization) process.

VDM THRASHING

Q: I usually run several Windows programs in a single Win-OS/2 session. I have 32MB of memory in my system. However, when I run these programs all at once, they seem to run much slower than when I run them one at a time. How can I improve my performance?

A: What you are probably experiencing is thrashing within your virtual DOS machine (VDM) session. Unlike OS/2 sessions, VDMs have limited amounts of memory allocated to them. This allocation is usually based in DOS-protected-mode-interface (DPMI) memory and is set with the DPMI_MEMORY_LIMIT DOS setting.

DOS and Windows applications are able to use more than the base 640K of memory that is the traditional DOS memory limitation through the use of DPMI and the other DOS-based memory extenders that are built into OS/2. Regardless of how much memory you physically have in your system, DOS and Windows programs can only use as much as you specify in the DOS settings for the session in which they run, up to a maximum of 64MB.

The programs you are running require more memory than the VDM has made available to it. Windows (or more specifically, Win-OS/2) thinks you only have a small amount of available space, because your DPMI_MEMORY_LIMIT for that VDM is set to indicate that. If it operates thinking the system only has 2MB, it will swap accordingly. If you raise that limit to, say, 32MB, you will not swap within the VDM, because it now assumes that much more memory is available. You can set it even higher than the amount of physical memory if you want, because all it will do is swap as any OS/2 program would. In fact, you may as well just set your VDMs that will require

more memory to a 64MB DPMI_MEMORY_LIMIT, because OS/2 will simply allocate memory to the VDM as requested.

FONTS

Q: Sometimes, when I'm running applications that use fonts, I get different lists of fonts than what I installed. Why is this?

A: A standard interface for programs that presents lists of fonts to users does exist, but the contents of those lists are still at the whim of the application programmer. Every device upon which graphics and/or text is to be displayed has something called a device context (DC)—a programmer's term for something you may know as the printer or screen driver. In addition to the device-context is a presentation space (PS), which allows the program to draw on a device.

When an application gives you a choice of fonts, it must query a device through the PS. The PS is connected to a DC. The information returned is a list of the fonts that the specific device has available. If the application querying the PS is associated with a printer DC, you will see the list of fonts that are available for that printer. If it is querying the screen, you will see the list of fonts that you've installed for screen display.

How do you tell the application which device to query? Usually, applications do not provide that option to you. For example, most word-processor programmers are more concerned with what the document will look like when printed, so a word-processing program queries and presents the printer fonts. If the screen font is not available, it will choose to display the match closest to the selected font. Ideally, fonts are installed for the printer and display as a pair, providing true WYSIWYG function.

DOS SHARE

Q: I need to be sure that the equivalent of **share** in OS/2 has locks available. What sets **share** in OS/2 sessions? Does an equivalent of the DOS **share** command exist? Do I need a special **autoexec.bat** that issues the **share** command, or does OS/2 do it already?

A: OS/2 includes the equivalent of **share**, intrinsically. Nothing needs to be loaded, and you don't have to execute any commands to set it up. You get file-sharing control, automatically. If a DOS program queries the system to see if **share** is loaded (by checking a system flag), the operating system shows the flag that says **share** is loaded. You don't have to do anything to obtain **share** for your applications.

MINIMIZE ON START

Q: Is there a way to automatically minimize a window from an application that autostarts?

A: In the Settings notebook of program-reference objects, you'll find the setting that starts a minimized program. By checking this setting, the program, when started from the program-reference object, will start minimized. You can, however, autostart programs in many different ways.

If you autostart programs with the **call** or **run** statements in **config.sys** (as explained earlier), you cannot start the program minimized by using the Start Minimized setting. This setting will not work if you autostart programs from **startup.cmd**. If, however, you put the program-reference object or a shadow of the program-reference object

in the Startup folder, this setting will take effect.

Another method starts programs minimized (if you want to use **startup.cmd**), and will work for programs running in OS/2 text windows. You can call a **.cmd** file from within **startup.cmd** that will have a **start** command for the program embedded within it. It will also specify the **/min** flag. You can have **start myprog.exe /min** in **startup.cmd**, which will start **myprog** in a minimized state.

SHUTDOWN SETTINGS

Q: Where does OS/2 store the lists used to restart at bootup for applications that are left running during shutdown?

A: When you shut down your OS/2 system, the open or closed state of objects is stored in the **os2.ini** file. When the system is

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rebooted, OS/2 will restart (or reopen) these objects. If they were folders, the folders will be reopened. If the folders were workareas, anything in the workarea will also be reopened. If the objects were program-reference objects, the programs represented by these objects will be restarted on boot up.

You can suppress the restarting of these objects with the **SET RESTARTOBJECTS** statement in *config.sys*. By setting **RESTARTOBJECTS** to **STARTUPFOLDERONLY**, you can limit the restart of objects to only those entries in the Startup folder.

RUNNING DOS SETTINGS

Q: Can I change DOS Settings for a session without having to shut down the program, edit the settings, and restart the program?

A: Some DOS Settings are used to set up control structures as the DOS Session or VDM is initialized. Some, however, can be changed "on-the-fly." You can find out which ones can be changed while the VDM is still running, by using the system icon pull-down menu. You'll see an entry in the menu for DOS Settings. Select it, and you'll see the list of available settings to change.

If your DOS program happens to be running in a full-screen VDM, you can use <Alt-Home> to put it into a window and change the settings. Use <Alt-Home> again to restore it to the full-screen session.

LOCKED DRIVES

Q: When I try to use CHKDSK on an HPFS drive, I receive a message stating that the drive is currently in use by another process and cannot continue. What am I

missing or doing wrong? Can I get around or accomplish this CHKDSK?

A: You are getting that error message because a program, system file, or .dll that is currently in use resides on that HPFS drive. You cannot run CHKDSK and request that it fix errors on a disk, if that disk has open files on it—regardless of whether it is HPFS or not. If you want to run CHKDSK on such drives, you must boot from another drive or device, such as a floppy-disk drive, or ensure that all program files on the disk are closed.

David Reich, a contributing editor to OS/2 Magazine and author of Designing OS/2 Applications, has been with the OS/2 development team since 1987. David is interested in your questions and suggestions. Contact him at CompuServe 76711,632 or Internet speedracer@vnet.ibm.com.

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End Notes cont'd from p. 72

DOS, the better Macintosh Finder, the better Windows, the better Chicago, the better NT (or whatever proprietary snares may emerge from Microsoft), the better Taligent... oops, sorry about that. Seriously, *B&H* outlines a long promising future for open OS/2-compatible operating systems based on IBM's portable microkernel technology developed jointly with Carnegie-Mellon University and other members of OSF (Open Software Foundation).

Chapter 3, "Come Together—Living with the Past" sums up the history that shaped OS/2 through its fascinating multibillion-dollar unfolding, dedicated (forced?) to support the uncountable legacy code lines from DOS, Windows, and earlier OS/2 versions. The real crunch is that Workplace is a true object-oriented user interface (OOUI), unlike the many lip-serving graphical user interfaces (GUI).

This OOUI theme runs throughout the rest of the book, which is full of practical insider hints on exploiting the object-power of the Workplace shell. Unlike many OS/2 guides, *B&H* avoids padding. Instead of merely copying or paraphrasing, *B&H* refers you directly to the IBM documentation when appropriate and concentrates on giving you fresh insights and clarifications. For example, the authors spend some time explaining the "object thing" (methods and properties—dogs that chase cats and bark in the night), so that the Settings notebooks for controlling object properties emerge as natural and intuitive. It supplies a generous quota of screen shots (albeit monochrome), but occasionally I felt the need for more. For example, it shows a typical Details View on page 74, but not the Details View page of the View tab in the Settings notebook from which the detail types are chosen. Similarly, in view of the importance accorded to the

B&H outlines a long promising future for open OS/2- compatible operating systems based on IBM's portable micro- kernel technology.

Workarea property of folders, it's a shame not to show the screen resulting from a File tab selection and the Workarea check box. Production costs clearly influence the number of screen shots, and we should be grateful that *B&H* meets the canonical \$24.95 barrier.

The price is especially attractive when you consider the included 3½-inch disk. Although, most of the "as is" shareware utilities provided are available from diverse BBS sources, it's handy to have them on one disk. You also get a PM version of the game Tetris, some BBS and vendor listings, and a host of background-tiling and icon bitmaps. Chapter 13 ("Customizing") covers the Icon Editor, helping you to play with the given icons and enliven your Workplace.

I do have three quibbles with VNR marketing regarding the attached disk. Book shop browsers see the back cover decal "Book contains a 3½-inch disk!" but there's no mention of the disk's contents, even if you scan the book's index. You must "break the seal," mount the disk, and consult the *readme* file before you know what you're getting—hardly possible until you've made the purchase based on trust and are back *chez vous*. My second quibble is that the disk label says

"WARNING: Making Copies is Strictly Prohibited," which is hardly in the spirit of traditional shareware. Finally, the *readme* tells you that "a current version of PKUNZIP for DOS or OS/2 is required to unpack these files. This can be obtained through the phone number for PKWare given in Appendix A of the book." I find this instruction a tad primitive considering the self-unpacking technologies that are available.

One more suggestion for the next edition: the Foreword by Scott Klinger extolling WordPerfect's support for OS/2 might usefully be modified, not only to reflect WordPerfect's shift of loyalty, but also to restructure a sentence of Proustian proportions:

"Although you could probably sit down at an OS/2 computer right now and immediately start to navigate through the Workplace shell, this interface is so powerful and offers so many configuration options to mold itself to work in a manner with which you are most familiar and comfortable, you would probably just scratch the surface of the features available to you."

But enough of this churlish banter. *B&H* is a rare classic that demands a place in your OS/2 library.

Stan Kelly-Bootle started computing on EDSAC I at Cambridge over 40 years ago and has written at least 11 books. His "Devil's Advocate" column in UNIX Review has been running since 1984. His Child of Devil's DP Dictionary will appear in the MIT Press Spring, 1995 catalog. He welcomes e-mail via CompuServe 70323,1560 or Internet skb@crl.com.

RESOURCES:

Using WorkPlace OS/2, The Power User's Guide to IBM OS/2 Version 2.1 (\$24.95)

by Lori Brown & Jeff Howard
Van Nostrand Reinhold
New York, NY, 1993.

READER SERVICE NO. 182



Workplace Power!

THE POWER USER'S BOOK FOR EVERYMAN BY STAN KELLY-BOOTLE

Using *WorkPlace OS/2, The Power User's Guide to IBM OS/2 Version 2.1* is my current favorite from the more than 20 popular OS/2 titles in the Van Nostrand Reinhold (VNR) Computer Library. This book is just about as well-informed as you can get on Earth. The authors, Lori Brown and Jeffrey Howard, are up-front IBMers who played key roles in the development and deployment of the OS/2 Workplace Shell. Their book, though, is not a bone-dry parade of facts. Yes, they write with the authority of back-room and front-line experience, but bubbling preemptively throughout is a proud-parent enthusiasm for their "baby."

This book reflects IBM's rediscovered evangelism, reminding me of my early Big Blue days in the 1950s (just replace Univac with Microsoft—we licked 'em then, we can lick 'em again!). I suggest that we call their book *B&H*, to match the honor awarded to the classic *The C Programming Language* (Prentice-Hall, 1978) by Kernighan and Ritchie, now universally known as *K&R*. The *B&H* front cover, by the way, spells it both "WorkPlace" and "Workplace," yet another case of insensitivity to case sensitivity, known to clog your *lint*.

I have another titular qualm, directed more at VNR than at the authors. The stated target reader-

**You may
wrongly assume that
this book is too
advanced for you,
which isn't so.**

ship is the "power user" and I'm worried that this may discourage some of the users who would benefit most from the book. The term, "power user" has suffered extreme fuzzification over the years and now subsumes a wide semantic web. It ranges from the praiseworthy (the TechWiz gurus, also known as "superusers") to the derogatory (the gullible spend-thrifts rushing to be first on the block with the hottest version of every gadget). The latter seem to outnumber the former where I live, in Marin County, Calif., the "I-want-it-all-now" community (yet with an organic soul of Jacuzzi green) north of San Francisco. Here, the border guards check the clock-speed of your portable before you cross the Golden Gate.

I suspect that VNR wanted to position *B&H* for the many potential readers falling between these

two extreme power-user definitions. My advice, though, is to ignore the book's subtitle. Perhaps, as an OS/2 user, you are content to mouse around the Desktop without a care for the "whence and whither" of the mysterious paddles thrashing away below. If so, it's no disgrace, but you may wrongly assume that this book is too advanced for you, which isn't so. Regardless of your level of expertise and whether you think of yourself as a power user or not, the first three chapters offer a highly-readable, succinct (a mere 37 pages total) introduction to OS/2 essentials (an OS/2 101, in fact). Understanding these chapters is *guaranteed* to improve your computing life.

Chapter 1 covers operating systems basics, the evolution of the PC and its user interfaces, and the genealogy of the Intel microprocessor family and its impact on such concepts as virtual memory and multitasking. If you are puzzled by SX, DX, SLC, SLC2, clock-doubling, segmented memory, protected modes, on-board caches, and microkernels (and we are talking real pocketbook-sensitive jargon here), Chapter 1 will put you right in 14 easy pages.

Chapter 2 is the brilliantly titled "A Brief History, A Long Future." Here the authors wax eloquent and convincing on OS/2 as the better

End Notes cont'd on p. 71



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In my last technology company, **System Integrators, Inc.**, a company founded with less than \$500 and sold 15 years later for \$128 million while listed on the New York Stock Exchange, I established a set of strategic principles which were created to serve SII's newspaper customers throughout the world. SII's clients included the Los Angeles Times, The Washington Post and the Financial Times of London.

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A number of these principles may seem foreign in the give-away addicted “Shrink Wrap Software” business. However, for me, they are a tried and true formula for success. Therefore, **DeScribe** has adopted them. Each of these ideas is intended to provide strength and longevity to **DeScribe**. They are intended to protect both **DeScribe**'s and its customers' investments while providing the highest level of technology and customer support.

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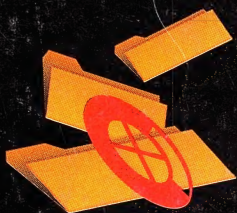
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